

# 'What is the effect of foreign direct investment inflows oneconomic growth in Pakistan?' An empirical analysis in the light of religious sectarianism as a catalyst for terrorism

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# Ayesha Serfraz

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# **'What is the effect of foreign direct investment inflows on economic growth in Pakistan?**

## **An empirical analysis in the light of religious sectarianism as catalyst for terrorism**

Ayesha Serfraz

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# **‘What is the effect of foreign direct investment inflows on economic growth in Pakistan?’**

## **An empirical analysis in the light of religious sectarianism as a catalyst for terrorism**

By  
Ayesha Serfraz

### **Abstract**

*FDI inflows play an important role in bringing growth and development to emerging economies. Pakistan is also heavily dependent on FDI inflows for achieving a high growth rate but the main obstacle being faced by Pakistan is increasing number of terrorist activities. Although there is a vast literature available which throws light on FDI lead economic growth relation based on terrorism but this study will surely add new dimensions to the ever increasing research on overseas investment in developing countries, specifically Muslim countries, by correlating religious sectarianism with FDI and economic growth. The present study analyses the effect of religious sectarianism on the relationship between FDI inflows and economic growth in Pakistan for the period of 1989-2016. For measuring sectarian terrorism, data of sectarian violence in Pakistan is taken for carrying out the empirical analysis. This study explores an empirical relationship by testing a two-way causality between FDI inflows and economic growth of Pakistan, using the techniques of Johansen Cointegration and VECM model. For testing two way causality, two separate models are constructed; in the first model FDI inflows is taken as a dependent variable with economic growth and sectarian terrorism as independent variables. In second model, economic growth is taken as a dependent variable and FDI inflows along-with sectarian terrorism are taken as independent variables. ADF and KPSS tests have been applied to check the stationarity status of variables included in dataset. Later Johansen Cointegration test has been applied twice for checking the strength of Cointegration. The results of VECM and system equation model show that the first model is more practical as the F-statistic is strong in case of first model as compared to second model 2 but the purpose is achieved and a two-way causality has been confirmed by empirical analysis. Wald test and Granger Causality tests have been applied to check the exogeneity and causality respectively. The results show that FDI is not weakly exogenous whereas the second model concludes that GDP is weakly exogenous. The same results are confirmed by Granger Causality test.*

**Key words:** *FDI inflows, Economic Growth, Sectarism, Johansen Cointegration, Pakistan*

## List of Abbreviations

ADF	= Augmented Dicky-Fuller (Test)
ARDL	= Auto Regressive Distributed Lag
ARMAX	= Autoregressive-Moving-Average Model
BoP	= Balance of Payment
CPEC	= China-Pakistan Economic Corridor
ECM	= Error Correction Model
FDI	= Foreign Direct Investment
GDP	= Gross Domestic Product
IMF	= International Monetary Fund
ISIS	= Islamic State of Iraq and Syria
KPSS	= Kwiatkowski-Pillips-Schmedt-Shin test
LDCs	= Least Developed Countries
MNEs	= Multinational Enterprises
NATO	= North- Atlantic Treaty Organization
OIC	= Organization of Islamic Conference
SAPs	= Structural Adjustment Programs
SATP	= South Asia Terrorism Portal
TSCS	= Pooled time-series, cross-sectional
US	= United States
VAR	= Vector Autoregressive Model
VECM	= Vector Error Correction model
WTC	= World Trade Center

## 1. Introduction

Several studies have tested the relationship between foreign direct investment (FDI) inflows and economic growth and found different results. If an analysis has to be conducted without going into depth, common sense conveys that FDI inflows do exert a positive impact on economic growth specially in case of developing economies since FDI inflows bring a complete package of financial and human resources to developing countries which fill the gap between savings and investment, exports and imports. An in-depth study unfolds many factors that hamper this relationship and religious sectarianism leading to terrorism is amongst the top factors which plays a negative role in achieving economic growth in developing and underdeveloped economies. According to a study conducted by [Buckley et al \(2002\)](#), the effectiveness of FDI inflows in recipient countries is dependent on congenial environment and investment friendly policies.

Pakistan is a developing economy with an annual growth rate of 4.24 percent in 2014-15<sup>(1)</sup> whereas 4.71 % has been reported for the fiscal year of 2015-16 by Pakistan Bureau of Statistics <sup>(2)</sup> and it needs a higher growth rate (minimum 7%) for achieving the goal of development. For this purpose, presently, FDI inflows serve as main engine of growth. Pakistan has been implementing liberalization policies for attracting higher levels of FDI inflows. Moreover, policy makers are continuously working on creating a friendly environment for foreign investors, but the factor of terrorism is discouraging foreign investors. Apparently terrorism is likely to be the most important factor disrupting FDI lead economic growth in Pakistan. According to [Shahzad et al \(2016\)](#), an increase in terrorist activities creates uncertainty and instability in economic and political accomplishments. As a result, foreign investors fear that their investments and profits might run the risk of loss which discourages them to invest.

Religious sectarianism or extremism is manifestation of prejudice and hatred amongst people believing in different religions as well as people belonging to different sects in the same religion and even encompasses the hatred between believers in a religion and non-believers. For example the differences between Muslims and Jews and between different sects amongst the Muslims (Shia-Sunni conflicts) as well as the differences between believers and Atheists. In case of Pakistan, as stated by [Fair \(2015\)](#), the internal war based on terrorist activities has claimed more lives than the wars fought at borders and all these clashes are based on religious sectarianism.

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(1) *Economic Survey of Pakistan (2014-15)*

(2) *Pakistan Bureau of Statistics\_(2014-15)*



The present study analyses the effect of sectarian terrorism on the relationship between FDI inflows and economic growth in Pakistan for the period of 1989-2016. In this study terrorism is taken in the sense of religious sectarianism, which is responsible for maximum number of terrorist activities in Pakistan. For measuring religious sectarianism, data of sectarian violence in Pakistan is taken for carrying out the empirical analysis. Though there are many factors which affect FDI lead economic growth, but this study only concentrates on terrorism in the form of religious sectarianism as the main obstacle.

While there are numerous other factors like energy crises, underdeveloped infrastructure and poor governance etc. but sectarian terrorism is the main stumbling block which is adversely affecting the entire socio-politico-economic structure of Pakistan and is having a deep impact on its international relations for the last more than one decade.

The present study seems to be a good contribution in the existing vast literature pertaining to the relationship between FDI inflows and economic growth because it would be adding new horizons through an empirical study to check the relationship between FDI inflows and economic growth in Pakistan in the light of religious sectarianism as a catalyst for terrorism depending on the most updated data till the current year of 2016. Moreover, this study is also unique and innovative in the sense it uses the factor of religious sectarianism to carry out the empirical analysis. The most common and dangerous form of sectarianism in Pakistan is religious sectarianism where different sects having particular mode of ideology conduct terrorist activities in the form of target killings, suicide bombings, honor killings etc. This study is a useful addition in the existing literature since it tests two way causation; in the first model FDI inflows has been taken as dependent variable with economic growth and terrorism as independent variables. In the second model economic growth plays the role of a dependent variable and FDI inflows along-with terrorism work as independent variables. The rationale behind estimating two-way causality is to check the impact of sectarian terrorism on relationship between FDI inflows and growth rate. Here an important point is worth mentioning that for checking two-way causality, majority of studies use Granger Causality test but its results are not that much reliable, yet at the end Granger Causality test is also applied to check the direction of causality. In addition Wald test has also been applied to check exogeneity. This paper is divided into 10 sections. Section 1 explains introduction, section 2 is a detailed review of literature based on existing studies. Section 3 concentrates on data and methodology. Section 4 explains empirical analysis. Sections 5 estimate model. Section 6 tests the Impulse response function and variance decomposition. Section 7 deals with model 2. Section 8 focuses on Cointegration Granger Causality test. Cointegration analysis has been discussed in section 9 and the last section explains empirical findings and concludes the study.

## **1.2 OBJECTIVE OF STUDY**

This study is an attempt to analyze the relationship between FDI inflows and Economic growth; taking religious sectarianism as the main and most important facet of terrorism and investigating into its relationship with FDI and growth. For this purpose time series data of Pakistan over the period of 1989-2016 has been analyzed. As this is one country study using time series analysis, the traditional ADF tests and Cointegration techniques have been used to test the relationship. KPSS test is also used for testing stationarity of data.

To remove all doubts, two way causation has been used by replacing dependent and independent variable for which Granger Causality test has not been preferred as its results are not that much reliable as compared to Cointegration and VAR models.

## **2) LITERATURE REVIEW**

The literature review will be focusing on the existing body of knowledge explaining relationship between FDI inflows and economic growth in the presence of religious sectarianism leading to terrorism. The literature review is divided into three sections. Section 1 will be discussing FDI inflows in detail and their relationship with religious sectarianism leading to terrorism, section 2 will be throwing light on relationship between FDI inflows and economic growth and the last section is based on detailed discussion about terrorism, religious sectarianism, sectarian violence and their relationship with FDI inflows and growth rate of Pakistan, throwing light on present situation. Also, it will explain the relationship of religious sectarianism and sectarian violence with terrorism. Moreover all three sections will be evaluating the relevant variables and explaining each variable separately while analyzing the history, the present trends and effects on Pakistan's economy. Historical patterns are discussed in order to increase the understanding of the subject matter and to explain current situation with more clarity.

### **2.1) FOREIGN DIRECT INVESTMENT INFLOWS**

This section will be discussing studies related to FDI inflows and terrorism which focus on Pakistan as a subject country. According to [Aqeel et al \(2004\)](#), developing countries like Pakistan are always faced with the problem of scarcity of capital and resources for satisfying domestic needs. On the other hand, due to high demand in developing economies, it is profitable for developed countries to invest in developing countries and thus FDI becomes a source of mutual benefits for both north and south.

There is a huge literature on benefits of FDI inflows to recipient country like [Falki \(2009\)](#), who explains that FDI inflows benefit host country by increasing employment opportunities as when a foreign firm invests in a host country, it establishes its own systems which provides jobs to many locals. Moreover, FDI is furnished with modern technology which increases the productivity and increases human capital, boosts exports which leads to an improvement in balance of payment deficits. In addition, new technology facilitates exploitation and proper allocation of local raw materials.

#### **A) Historical Patterns of FDI inflows in Pakistan**

In 1947, the newly born state of Pakistan was faced with many challenges and the basic one was the question of its survival. In the presence of such basic needs, other economic activities remained at the back.

During the first 11 years (1947-1958), Pakistan maintained a strict control over FDI and liberalization policies as the country was not stable<sup>(3)</sup>.

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(3) *Abbas (2015)*

[Hussain \(2009\)](#), carried out a detailed study about different political regimes of Pakistan and their performance. According to Hussain, Ayub Khan's government is labelled as "The Golden Sixties". Khan's government came into being in October 1958. Ayub Khan, implemented five year plans for economic planning. This gave impressive results with annual growth rate of Pakistan increasing from 3 percent to 6 percent. Many advances were made in agriculture and manufacturing sector. Liberalization policies were carried out and trade was encouraged. [Hussain also](#) claims that if Ayub Khan's government had continued for another two decades, Pakistan would have emerged as a developed country. But due to opposition's claim of increased income disparities, Khan's government and Pakistan went through a set-back in the form of separation of East Pakistan in 1971 now known as Bangladesh. This lead to more instabilities and proper attention could not be given to liberalization policies.

However the next government, headed by Zulfikar Ali Bhutto followed the policy of nationalization which resulted in negative effects on liberalization policies.

The regime of Zia-ul-Haq (1977-1988) has been analyzed in detail by [Mohiuddin \(2007\)](#)<sup>(4)</sup>. According to the author, in this era Pakistan witnessed both Islamization and economic liberalization which lead to an annual growth rate of more than 6 percent. His regime promoted business friendly policies including privatization of public sector industrial units. Government's monitoring role was lessened and industrial licensing procedure was liberalized.

Mohiuddin further added that foreign remittances from overseas Pakistani workers touched new heights during Zia years and by 1984, these foreign remittances were not only the largest source of foreign exchange earnings for Pakistan's economy, since about 86 percent of the trade deficit was met through these remittances, but also covered the 6 percent gap between savings and investments and these were four times greater than the net aid inflow to Pakistan.

According to [Hussain \(2009\)](#), Zia cooperated with the United States (US) for overthrowing the Soviet Union from occupation of Afghanistan, due to which large scale military and economic assistance flowed from US to Pakistan. Although this short-term objective was achieved but in the long term the spread of Kalashnikov and drug culture, ethnic and sectarian violence, and the emergence of jihadist parties and spread of militancy are also attributed to this era. With regard to Islamization, State laws were modified and new Shariah laws were enforced.

With the withdrawal of Soviet Union from Afghanistan, US also lost interest resulting in steep short fall of military/economic aid to Pakistan, as a consequence of which, Pakistan had to approach the International Monetary Fund (IMF) for assistance in 1988.

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(4) For details see Chapter "Islamization and Liberalization" of the Economy under the Military Government of Zia-ul- Haq (1977-1988)

[Zakaria \(2014\)](#) states that the period from early 1980s onwards to early 2000 is marked with Structural Adjustment Programs (SAPs) and trade reforms under the supervision of International Monetary Fund (IMF) and World Bank (WB). The purpose of SAPs was to implement the system of free market economy and Pakistan cooperated and reduced trade barriers like tariffs and other quantitative restrictions. These steps lead to an increase in trade but FDI inflows also increased. Zakaria also conducted an empirical analysis to study the effects of trade liberalization on exports, imports and trade balance in Pakistan for the period of 1981-82 to 2007-08 and found that trade liberalization worsened balance of trade in Pakistan since liberalization policies resulted in higher imports as compared to exports increasing payments rather than receipts.

[Akbar and Akbar \(2015\)](#) studied the patterns of FDI inflows in Pakistan for the period of 2000-2013. They carried out an empirical study related to determinants of FDI inflows in Pakistan and found that FDI inflows increased during 2000-2008 and fell during 2009-2013. Their arguments were consistent with the study carried out by Hussain (2009). The better performance during 2000-2008 was due to the liberalization policies carried out by the military government of Gen Pervaiz Musharraf. During that period, FDI inflows increased to a great extent leading to improvement in economic indicators in Pakistan and making it third fastest growing economy after India and China. But FDI inflows fell during the period of 2009-2013 because of bad governance, poor law and order conditions and especially because of high terrorist activities.

## **B) Further details and discussion on already established literature**

According to [Iqbal and Lodhi \(2014\)](#), Pakistan's economy has been facing instability both at micro and macro level resulting in a fall in FDI inflows and increase in poverty and unemployment. Religious violence and extremism have worsened the situation and its roots are connected to historical political policies. Authors add that the acts of violence have become a common practice to achieve ideological, religious and political goals. These activities include terrorism specifically communal and sectarian violence. Moreover, after the incidence of 9/11, religious sectarianism and extremism emerged in its most severe forms in the country leading to negative impact on international relations resulting in low FDI inflows and continuous decline in economic growth.

According to a study conducted by [Mehmood \(2014\)](#), Pakistan is attracting more and more researchers for studying the impact of terrorism on the economy since it has a long and intense history of terrorism, consequently researchers are able to study and analyze the economy of Pakistan for a long run time period. The history goes back to Zia-ul-Haq era (as mentioned before). According to the author, estimates of direct cost of post 9/11 terrorism is around 7 billion US dollars, cumulatively terrorism has cost Pakistan around 33.02% of its real National Income.

As Pakistan ranks 127<sup>th</sup> at UN Human development Index with 22.6% of population living on less than 1.25 dollars a day (according to UN statistics, 2011<sup>(5)</sup>).

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(5) United Nations (2010:8)

This is an alarming situation for Pakistan and it needs an early end to the war going inside based on terrorist activities related to religious discrimination and sectarian violence. It must take steps for encouraging investment which would help in increasing economic growth.

Most of the studies related to FDI, economic growth and terrorism mainly focus on the after effects of 9/11 incident as Muslim countries got extremely affected. According to [Rehman and Askari \(2010\)](#), although economists agree that there are many determinants of economic growth but it needs to go in more depth. Quoting a study conducted by [Barro \(2004\)](#), authors mentioned a very important point:-

*“Successful explanations of economic performance have to go beyond narrow economic variables to encompass political and social forces.”<sup>(6)</sup>*

According to authors, religion is one such factor which not only affects social norms but business, politics and economic activities are also affected by religious views and practices. They developed an Economic Islamicity Index (EI<sup>2</sup>) to analyze the working of Islamic countries and for that they took 208 countries (according to sub-groups which are High, Upper-Middle, Lower-Middle, and Low Income Countries, OECD and Non-OECD Countries, OIC Countries, and Non-OECD Non-OIC Countries, and Persian Gulf Countries). According to their results, Pakistan ranks 145 among Organization of Islamic Conference (OIC).

The rank shows the level of performance of the particular Islamic country in context of governance, economic activity, policy making etc. but they emphasized that these are preliminary results and a concrete conclusion cannot be drawn. According to their conclusion

*“It is difficult at this time to draw more concrete conclusions other than to say that it is our belief that most self-declared Islamic countries have not adopted economic and financial policies that are in conformity with Islamic teachings.” (Page 24)<sup>(7)</sup>*

Authors add that if Islamic teachings are to be considered, they do not include violence, division in sects or terrorism but these unfortunate incidents are taking place in many Islamic countries including Pakistan.

Another study by [Qian and Back \(2011\)](#) analyses the after effects of 9/11 attacks on both developed and developing economies. According to them, the 9/11 attacks had extremely appalling effects on the global economy as a whole. They stated that these effects are more serious in case of developing economies and high political risk exerted negative impacts on FDI inflows.

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(6) Barro (2004)

(7) Rehman and Askari (2010)

They mentioned three major types of political risks that caused harm to FDI inflows and growth of developing countries:-

- (i) Nationalization of foreign assets resulting in frequent breach of contracts leading to a threat to foreign investors.
- (ii) Unstable policies related to FDI.
- (iii) War, political violence including terrorism which leads to damage of foreign assets.

All these factors exert a negative impact on working of an economy specially developing economies, since they have high rate of terrorist activities based on religious sectarianism and discrimination. As a result foreign investors are discouraged leading to economic, political and social shocks in developing economies. Unfortunately, Pakistan is also going through a tough time because of all the factors which hinder investment and growth especially in recent past, sectarian terrorism and violence have added fuel to the fire and nation is being divided in sects and killing each other in the name of religion.

[Hyder et al \(2015\)](#) in their study, empirically analyzed the relationship between terrorism and economic growth in case of Pakistan. They emphasized that though terrorism is not a new phenomenon but it gained more importance after 9/11 attacks on the US in 2001. Although this tragic incident affected the whole world but developing countries of Middle East and South Asia faced more severe consequences and a series of war on terror started. In their own words

*“Pakistan has been a victim of terrorism for the last three decades, due to her involvement in wars in Afghanistan. Besides involvement in those wars, ethnic and sectarian conflicts among different factions and separatist nationalistic movements on Pakistani soil are other sources of terrorism in Pakistan.”*(Page 705)<sup>(8)</sup>

They added that sectarian conflict plagued Pakistan and it started during Zia-ul-Haq regime. The Islamization policies of Zia-ul-Haq divided the nation into different sects leading to religious conflicts and Sectarianism (each sect claimed that it is superior to the other).

For empirical analysis, they applied the technique of Johansen Cointegration test and concluded that Pakistan has paid and is still paying the cost of terrorism in the form of loss of human lives, poverty, capital flight, destruction of infrastructure, reduction in exports, low public expenditures on law and order.

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(8) Hyder et al. (2015)

As a result, economic growth has been negatively affected. In addition, due to terrorist activities, FDI inflows fell sharply and international trade and business activities have been damaged to a great extent.

Presently Pakistan is facing many problems and they are not just limited to economic activities but political instability and extremely disturbed social conditions are acting as obstacles in achieving the goal of development. Terrorism, internal conflicts and skirmishes at international level are giving rise to extremely hostile conditions for foreign investors still FDI inflows are showing an upward trend mainly due to the biggest project of China-Pakistan Economic Corridor (CPEC). As a result, the FDI literature related to Pakistan is continuously adding new prospects and details making researchers more curious to carry out studies related to FDI in Pakistan.

Some important figures related to FDI inflows in Pakistan have been mentioned in the following table. One important thing to note is that although overall FDI inflows have fallen, yet the net effect is positive because almost half of the total FDI that Pakistan received in the last fiscal year originated from China alone. FDI from China amounted to \$593.9 million in 2015-16, which is up by 131.3% from 2014-15 and constitutes 46.3% of the total FDI Pakistan received over the entire fiscal year. (*Published in The Express Tribune, July 21<sup>st</sup>, 2016.*)<sup>(9)</sup>

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(9) <http://tribune.com.pk/story/1146075/2015-16-china-helps-fdi-pakistan-surges-38-8/>



### C) Some Important Figures

#### Foreign Investment inflows in Pakistan (\$Millions)

**TABLE-1 Country Wise FDI Inflows (\$ Million)**

COUNTRY	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
USA	1,309.3	869.9	468.3	238.1	227.7	227.1	212.1	209.0	(65.5)
UK	460.2	263.4	294.6	207.1	205.8	633.0	157.0	174.3	79.8
U.A.E	589.2	178.1	242.7	284.2	36.6	22.5	(47.1)	216.4	164.2
Japan	131.2	74.3	26.8	3.2	29.7	30.1	30.1	71.1	21.6
Hong Kong	339.8	156.1	9.9	125.6	80.3	242.6	228.5	83.4	130.9
Switzerland	169.3	227.3	170.6	110.5	127.1	149.0	209.8	2.8	76.0
Saudi Arabia	46.2	(92.3)	(133.8)	6.5	(79.9)	3.2	(40.1)	(64.8)	(102..2)
Germany	69.6	76.9	53.0	21.2	27.2	5.5	(5.7)	(20.3)	(33.0)
Korea (South)	1.2	2.3	2.3	7.7	25.4	25.8	24.4	14.3	(18.6)
Norway	274.9	101.1	0.4	(48.0)	(275.0)	(258.4)	(21.6)	2.7	172.3
China	13.7	(101.4)	(3.6)	47.4	126.1	90.6	695.8	255.3	593.9
Others	2,005.2	1,964.2	1,019.6	631.3	289.7	285.5	224.4	261.7	90.4
Total including Pvt. Proceeds	5,409.8	3,719.9	2,150.8	1,634.8	820.7	1,456.5	1,667.6	851.2	1,281.1
Privatization Proceeds	133.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FDI Excluding Pvt. Proceeds	5,276.6	3,719.9	2,150.8	1,634.8	820.7	1,456.5	1,698.6	851.2	1,281.1

SOURCE: BOARD OF INVESTMENT AND STATE BANK OF PAKISTAN

Note: Pakistan's Fiscal Year runs from 1st July till 30th June next year. The figures in brackets are in negative.

Source link: <http://boi.gov.pk/ForeignInvestmentinPakistan.aspx>  
As accessed on September 3, 3016.



## 2.2) FDI INFLOWS AND ECONOMIC GROWTH IN PAKISTAN

This section of literature review concentrates on the relationship between FDI inflows and economic growth of Pakistan. Since Pakistan is a developing economy and for developing countries, high economic growth rate is very important to enter the comity of developed countries. Same point has been emphasized by [Chenery and Shout \(1966\)](#) and according to them the present focus of all developing countries is towards getting a high growth rate of economic and social indicators. To achieve this goal, foreign assistance is playing the most important role which is leading towards an increase in economic growth.

[Iqbal and Zahid \(1998\)](#) conducted an empirical study to analyze the effects of some important macroeconomic variables on Pakistan's economic growth. The authors state that Pakistan has been facing a downward trend in economic growth mainly because of unstable political and economic conditions which include increase in foreign debt, low demand of Pakistani products in international markets, poor law and order situation, low level of physical and human capital. The empirical results suggested that openness of Pakistan's economy promoted growth. Also government should provide education in order to increase human capital.

There are many determinants of economic growth in Pakistan but out of all these, FDI inflows have proved to be the most important determinant amongst others. Therefore many studies have empirically tested the relationship between FDI inflows and growth rate in Pakistan. [Malik \(2015\)](#) carried out an empirical study to examine the impact of FDI inflows on economic growth of Pakistan over the time period of 2008-2013 and found that FDI is not the only factor leading to high economic growth but trade liberalization and domestic capital also have a positive impact on growth rate. The author also recommended that government should take steps to increase both foreign and domestic investment and should provide protection to domestic industries so that total output increases which will lead to a higher economic growth in Pakistan.

[Atique et al \(2004\)](#) conducted an empirical study by using data of Pakistan covering a period of 1970-2001 and concluded that the positive impact of FDI on economic growth of Pakistan increases under an export promotion (EP) system as compared to import substitution (IS) regime. They suggested that Pakistan must adopt such policies which encourage FDI inflows as Pakistan's economic growth is highly dependent on FDI inflows. Another empirical study carried out by [Gudaro et al \(2010\)](#) analyzes the impact of FDI inflows on growth rate of Pakistan, using multiple regression model using data of Pakistan covering time period of 1981-2010. They found that an increase in FDI inflows lead to a higher growth rate and thus government must concentrate on policies to create a friendly environment which could attract foreign investors.

[Zafar et al \(2016\)](#) empirically tested the impact of FDI flows and trade openness on growth rate of Pakistan by using a time series data for the years of 1994-2014. After applying Johansen Cointegration test and ECM, they found that FDI has a positive and significant impact on growth rate but trade openness has a negative, though significant, relationship with growth rate. The authors add that since FDI has a positive relationship with growth rate, factors like political stability and improvement in macro level variables can make this relationship stronger over a long time period. Regarding trade openness, although it is significant but with a negative sign because Pakistan being a devel-

oping country, is presently unable to compete with foreign products and thus domestic products and industries are facing losses both in national and international markets. They suggested that better policies of trade openness can result in a positive impact on growth rate.

[Ghazali \(2010\)](#) is of the view that FDI inflows have strong impact on economic activities of Pakistan and they play a significant role in increasing exports and economic growth rate of the country. The author conducted an empirical analysis to test the causal relationship between FDI inflows, domestic investment and economic growth of Pakistan covering a period of 1981-2008. The Cointegration analysis reveals that FDI leads to an increase in domestic investment which results in higher economic growth rate and this relation runs both ways. The results also suggest that domestic savings should be encouraged in Pakistan as they lead to an increase in both domestic and foreign investment, resulting in a higher growth rate.

[Javaid \(2016\)](#) conducted an empirical analysis to investigate the relationship between FDI inflows and growth rate of Pakistan by using time series data covering the range from 1966 to 2014. After applying ARDL-ECM technique, the results indicated that FDI inflows have a significant and positive impact on growth rate in Pakistan both in short and long run.

On the other hand, many studies find that FDI has either no effect on economic growth of Pakistan or has a negative influence on growth rate. Like [Ali \(2014\)](#), in his study explored the impact of foreign capital flows on economic growth in Pakistan for the period of 1972-2013. The study divided foreign capital flows in three categories; foreign debt, FDI and worker's remittances. The results showed that foreign capital flows hamper growth over long run. The study suggested that domestic investment must be encouraged to have a high rate of economic growth since high foreign debts hinder economic growth of Pakistan. Moreover, FDI in the presence of better macroeconomic policies and improved human capital can be beneficial for long run growth and development of Pakistan's economy.

Similarly, [Saqib et al \(2013\)](#) in their study state that economic performance of any country depends on many factors but in case of developing countries, FDI inflows have proved to be the most important determinant of economic growth. The authors empirically tested the relationship between FDI inflows and economic growth of Pakistan using time series data covering the period of 1981-2010. In addition to FDI inflows, four other variables are also tested which include debt, trade, inflation and domestic investment. The results are totally opposite as compared to other studies testing the relationship between FDI inflows and growth rate. Their findings indicate that there is a negative relationship between FDI inflows and growth rate of Pakistan. Same results were obtained for the other variables except domestic savings which show a positive impact on growth rate. The probable reason for conflicting results could be due to the profits taken back by the investing country which may be due to the limited capacity of host country to absorb new knowledge and technology transferred through FDI inflows.

[Arshad \(2012\)](#) found same results regarding the relationship between FDI inflows and economic growth. The author used time series data of Pakistan for the period of 1965-2005 and after applying Cointegration VAR framework on the variables of FDI, trade (exports and imports) and economic growth of Pakistan, he found that both exports and imports have a positive long run relationship with growth but the impact of FDI on

growth is not significant. Granger causality test also revealed that FDI does not cause GDP growth but GDP causes FDI.

[Yasir and Ramazan \(2013\)](#) conducted an empirical study to test the relationship between FDI inflows and growth rate of Pakistan. This study made use of time series data covering the period of 1978-2010 and applied ARDL (Auto Regressive Distributed Lag) model. The results conclude that FDI and exports do not have a strong long run relationship with economic growth. Authors recommended that policy makers should concentrate on devising export promotion policies concentrating on specialization in production and economies of scale. This would stimulate Pakistan to import high level products and modern technology for strengthening domestic industry which would result in a positive impact on FDI-led economic growth as country would be able to absorb the new techniques and better technology being transferred through FDI inflows.

Majority of studies find a positive relationship between FDI inflows and growth rate but many studies suggest to develop friendly policies to attract more FDI. [Ahmad et al \(2012\)](#) in their study empirically investigated the relationship between FDI inflows and economic growth of Pakistan. After applying Cointegration test and ECM on time series data of Pakistan for a period of 1971-2007, they found that there exists a positive relationship between growth rate and FDI inflow both in short and long run. In addition, authors recommended that policy makers must formulate FDI attracting policies so that economic growth keeps on increasing.

Similarly [Najaf and Najaf \(2016\)](#) also found a positive relationship between FDI inflows and economic growth of Pakistan. They used data of Pakistan from 1991-2011 to empirically test the relationship between major macroeconomic variables and FDI inflows. Their results suggested that FDI has a positive relationship with growth rate of Pakistan but inflation has a negative impact on FDI. Also political stability is very important for attracting more FDI. They also emphasized on political stability and a friendly atmosphere to attract more FDI in Pakistan. Quoting their own words

*“A dynamic market economy requires political stability for its best possible Outcomes. Political instability generates economic uncertainty because of turn down in Investment. Political instability is reducing the confidence of investors in our country. In business sector decisions are mainly based on the political stability not on the type of the government. Business friendly environment must be created on priority to attract large FDI. To maximize the benefits of FDI persistently Pakistan should also focus on developing human capital and technology Jobs for unskilled population when compared with service sector.” (Page 101)<sup>(10)</sup>*

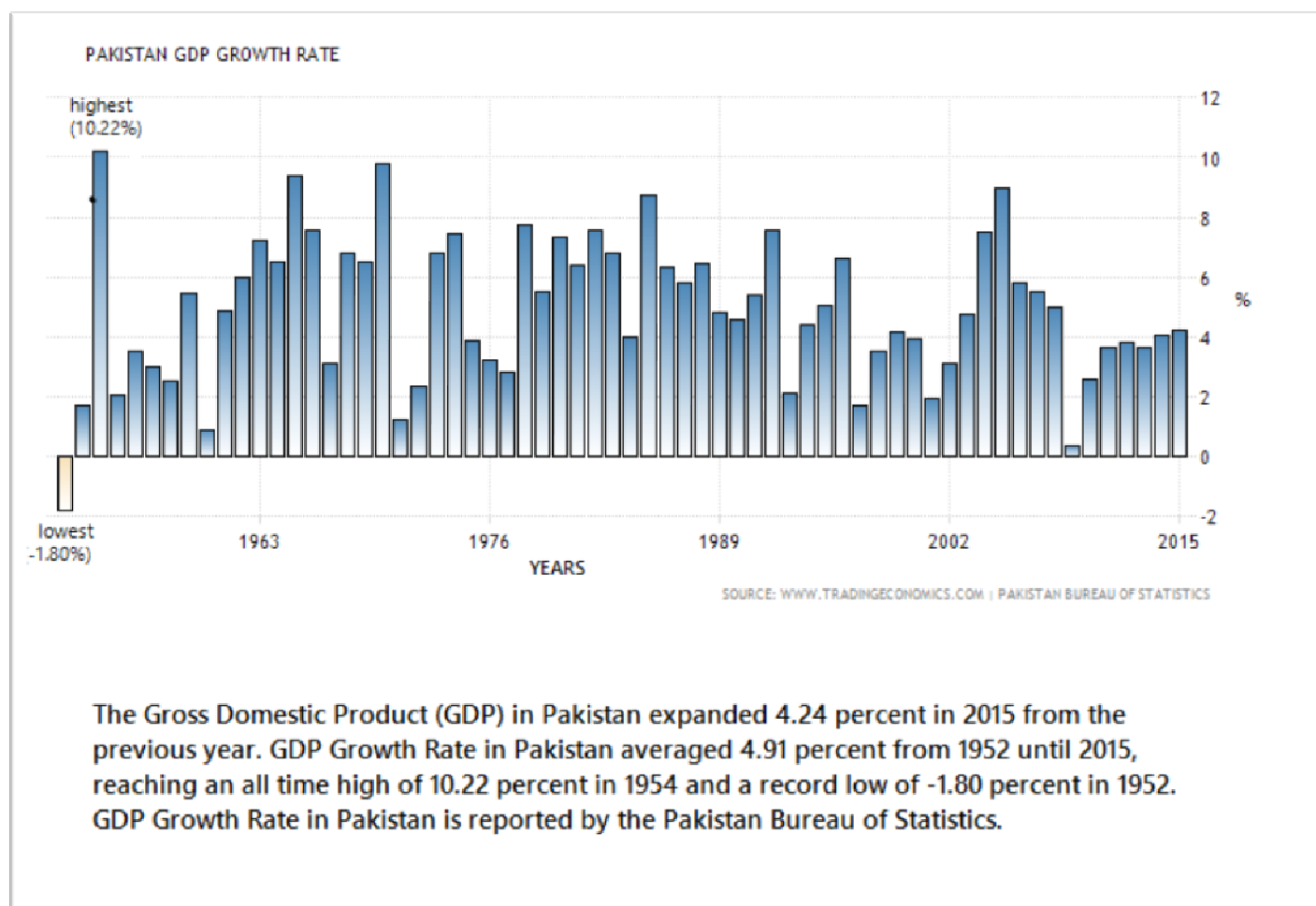
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(10) Najaf and Najaf (2016)

## SOME FIGURES

Economic growth of Pakistan has shown different trends over time since 1947 and many factors have contributed towards these fluctuations. Policy makers and governments have been implementing various measures to improve economic conditions, yet it has been facing both upwards and downwards trends over the period of time. Trends of economic growth of Pakistan can be observed with the help of following figure:-

**GRAPH-1: GROWTH RATE OF PAKISTAN OVER YEARS (1952-2015)**



SOURCE: [www.tradingeconomics.com](http://www.tradingeconomics.com)

NOTE: Gross Domestic product (GDP) or Gross National Product (GNP) are used as a proxy measure for economic growth.

As mentioned earlier that in 2016, a growth rate of 4.71 has been reported by the Pakistan Bureau of Statistics, State Bank of Pakistan and Economic Survey of Pakistan (issued by Ministry of Finance, Pakistan)

### 2.3) TERRORISM, FDI INFLOWS AND GROWTH RATE

Although religious sectarianism as a catalyst of terrorism in Pakistan has been discussed in some detail in section 2.1, yet this section will also throw light on the fact that religious sectarianism is the most important facet of terrorism affecting FDI lead economic growth in Pakistan. However, before that, this section will discuss terrorism in detail. In addition, its impact on FDI and economic growth relationship shall be debated initially through the international studies available in the literature and in later part the details shall be limited only to the case of Pakistan. Besides FDI, terrorism and economic growth, many other determinants of all three variables will be discussed in detail.

#### a) What is terrorism?

Terrorism has many forms and often its results are unpredictable but they are always disastrous. There are many definitions of terrorism given by different researchers, analysts, writers etc.

According to [Enders and Sandler \(2011\)](#),

*“Terrorism is the premeditated use or threat to use violence by individuals or subnational groups to obtain a political or social objective” (page 4)<sup>(11)</sup>.*

According to these authors, there are mainly two motives for carrying out terrorist activities:-

- 1) *Political Motives*—in this case violence and threats are made to get a political decision maker to respond to the demands made by terrorists.
- 2) *Social Motives*—to create fear in the society to expand their audience to get their demands fulfilled.

[Ismail and Amjad \(2014\)](#), state that the existence of terrorism indicates that there are tensions at both social and political level. Terrorism results not only in substantial political and economic damage, but the most painful result of this activity is loss of human life. There are many causes of terrorism like poverty, unemployment, economic and social inequalities, ethnicity, religious frictions, international conflicts etc.

There are many definitions and views about ‘what is terrorism?’ but all have one thing in common that terrorism is based on creating political, economic, social, religious and ethnical unrest. Besides it creates tensions between different countries. Moreover the motives of terrorism cannot be easily summed up since whenever a terrorist activity takes place, different motives are presented, but mostly those are based on guess work and in many cases those remain shrouded in mystery and reality never sees light.

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(11) *Enders and Sandler (2011)*

## Who is a terrorist?

There is no consensus definition of a terrorist that could explain his traits. Terrorist, being a human being cannot be attached with a specific nationality, religion or beliefs—it is a very complex issue which cannot be put in few words to create a specific profile because one person/group can simultaneously be considered as a terrorist by some and a freedom fighter/hero by others. Taking from most narrow to most wide act of terrorism, a normal human mind can comprehend, a person shouting at home can be a terrorist...and a person killing others through gun attacks, bomb blasts, suicide bombing or any other way of damaging human life, playing with human emotions, bringing harm to economic and political resources---- also belongs to this category. Why he conducts such activities and even worst how he can blow himself up--- there is no single and particular answer but whatever this is, it is related to human psyche.<sup>(12)</sup>

### c) A brief history and present scenario of terrorism in Pakistan

[Romaniuk \(2015\)](#) in reference to [Emon Murphy's 'The Making of Terrorism in Pakistan'](#), has argued that Pakistan has been referred to as a “terrorist state” by various countries, religious scholars, policy makers and many national and international organizations. Many view terrorism in Pakistan as a result of religious conflicts and extremism. Moving on to a narrow aspect, different sects in religion (Islam) are held responsible for terrorist attacks. According to Romaniuk's analysis, Murphy in his book has referred the period of Zia-ul-haq (1977-1988) a “turning point”-----The Islamization of Pakistan. Foreign elements in this case have been recognized as Afghan Jihad and Soviet Invasion of Afghanistan, the role of the United States, Saudi Arabia and Iran and most importantly the rise of sectarian violence and terrorism. Further the issue of Kashmir dispute between India and Pakistan has always added fuel to fire.

According to a study by [Hussain \(2010\)](#), internal conflicts lead to creation of mainly four types of terrorist groups in Pakistan based on following differences:

- (i) Language
- (ii) Sect based (sectarian)
- (iii) Race-based (especially refugees from India who settled in Karachi, had their grievances about the transfer of the country's capital from Karachi to Islamabad.
- (iv) Religion (majority and minority religious groups)

Unfortunately number of terrorist activities in Pakistan have been increasing which include all kinds of viciousness starting from domestic violence, suicide bombing, target killing, kidnapping etc.

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(12) *Author's own views. This topic has not been discussed in detail as it is a passing reference but has been included in study because this question also needs attention keeping in view the present global scenario.*

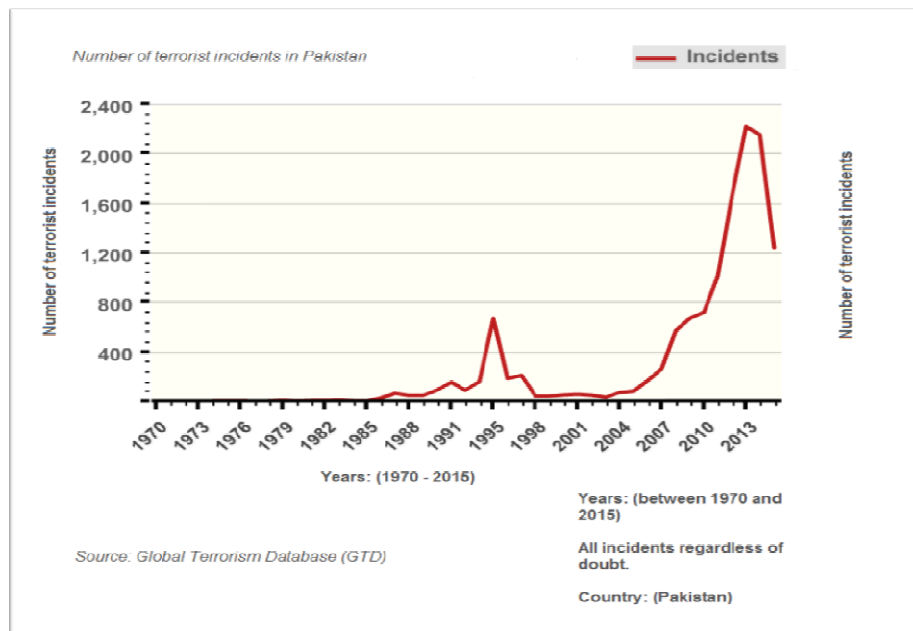


According to [Farooq and Khan \(2014\)](#), immediately after the attack on World Trade Center (WTC) in US in September 2001, American President Bush declared that Osama Bin Laden was the prime suspect and demanded from the Taliban government in Afghanistan to hand him over to the US. When the Taliban government did not accept the US demand, the American and NATO forces attacked Afghanistan by declaring it a “war on terrorism” and on American demand, Musharraf, the then military ruler of Pakistan, became an ally of the American and NATO forces without consulting his Nation. Since then Pakistan is facing increased terrorist attacks as a result of which it has greatly suffered socially, economically and politically. The authors add that US had multi-purpose agenda including inter alia

- (i) To block the spread of political Islam and the unity among the regional countries like Pakistan, Iran, Afghanistan and Central Asian Republics,
- (ii) To limit the growth and development of Pakistan as the only nuclear Muslim State so that it remained dependent on US aid, and
- (iii) To contain the rise of China as an Economic and Military power.

Figure 2 shows the number of terrorist incidents which took place in Pakistan during the period of 1970-2015. The terrorist activities/incidents show a continuous upward trend after 2001 because mainly terrorism in Pakistan saw its peak after 9/11 incident. Drone attacks increased resulting in a historically high death toll. In addition, US and NATO attacks also lead to increase in terrorist activities but government started a military operation (Zarb-e-Azab) on 15<sup>th</sup> June 2014 which was successful and terrorist activities decreased.

**GRAPH-2 NUMBER OF TERRORIST INCIDENTS IN PAKISTAN (1970-2015)**



Source: Global Terrorism Database (GTD)  
 South Asia Terrorism Portal (SATP)  
 Hussain (2010)

#### **d) Terrorism in the form of religious Sectarianism, FDI inflows and economic growth**

**(i)**

##### **International Studies**

[Quin and Back \(2011\)](#) in their study have discussed about the effects of political risks on FDI in case of both developed and developing countries. For carrying out empirical analysis, they used 12 category political risk index and reached at following conclusions:-

(a)

Political risks significantly affect the determinants of FDI in both developed/industrialized and developing economies.

(b)

After comparing the political risk components, they found that all aspects of political risk do not have same impact on FDI rather political risks have become more significant and important determinants of FDI when developed/industrialized countries are analyzed.

In addition their findings suggest that a good democratic structure and friendly investment environment encourage FDI flows for both industrialized and developing countries. They added that better law and order situation, low religious tensions and high government stability are the factors that lead to high FDI inflows to developing countries.

According to [Busse and Hefeker \(2007\)](#), FDI is very important for economic development in case of emerging and developing economies. The authors examined the influence of government stability, socio-economic conditions, investment profile, internal and external conflicts, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability and quality of bureaucracy (basically all the factors which are related to either violence/terrorism and economic growth/development) on FDI inflows. For this purpose, a sample of 83 developing countries was used covering a time period of 1984-2003. Their results concluded that the political risk and institutional indicators (mentioned above) are first analyzed by Multinational Enterprises (MNEs) while investing in developing countries. If there is government instability, religious tensions and doubts about democratic accountability, MNEs are not much confident about the safety and profitability of their investment. Besides, all these factors are also related to economic growth which gets affected.

[Osemwengie and Oriakhi \(2012\)](#) conducted an empirical analysis to investigate the impact of National Security on FDI in Nigeria. They used the data of Nigeria covering the period of 1980-2009 and after applying Least Square method, they found that there is a negative relationship between National Security and FDI.



The authors recommended that policy makers should give attention towards solving security issues like kidnappings, killings, corruption, bombings, domestic terrorism <sup>(13)</sup>, social unrest and suicide bombings as they all result in loss of tourism, destruction of infrastructure and create a fear of loss among foreign investors as a result economic growth gets negatively affected. They also mentioned that the issue of terrorism gained more attention after the incidents of 9/11 attacks. These issues must be solved not just in Nigeria but in all other developing countries so that they can attract higher FDI for achieving a high level of economic growth rate.

[Li and Schaub \(2004\)](#) statistically analyzed the effect of economic globalization on transnational terrorism <sup>(14)</sup> within countries by using a sample of 112 countries and data from 1975 to 1997. The terrorist attacks of 9/11 have been mentioned as an example of transnational terrorism.

After applying the pooled time-series, cross-sectional (TSCS) design, their study concluded that trade, FDI and portfolio investment of a country have no direct impact on transnational incidents within its geographical boundaries. According to their findings, when development level in a country's economic partner improves, the incidents of transnational terrorist attacks decrease within the country which means that increasing economic integration between the country and its economic partners helps in discouraging the terrorists from those partner countries to undertake terrorist attacks within this country.

[Alomar and El-Sakka \(2011\)](#) are of the view that the after effects of 9/11 terrorist attacks have clearly proved that terrorism has a negative impact on FDI, economic growth and trade specially in case of developing countries. They conducted an empirical analysis using a panel data of 136 LDCs. After applying Cointegration test, their study concluded that terrorist activities have a negative and significant impact on FDI inflows in case of LDCs. As a result GDP growth rate also gets negatively affected.

[Meierrieks and Gries \(2013\)](#) in their study mention that although seemingly terrorism is negatively related to economic growth yet the relationship is complex as there are different conclusions/viewpoints related to this topic by different authors. They add that on one side, terrorism results in loss of human and physical capital, on the other side it has devastating effects on consumption, investment, government spending, and savings. It also results in creating an uncertain environment for foreign investors leading to discourage in foreign investment. They used panel data of 160 countries from 1970-2007 and found that terrorism has severe effects on economic growth of Islamic countries with low levels of politico-institutional development, political instability and persistent terrorist activity. On the other hand, they stated that advanced/western countries need not fear about terrorist activities because of strong economic and political stability.

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(13) According to authors, "Domestic terrorism is where the perpetrators, victims, supporters, and targets are all from the home country and the incidents normally occur on home soil. For instance, the kidnapping of a citizen for political purposes or economic reasons, the suicide bombing of a church or government buildings are domestic terrorist incident."(page 90)

(14) According to authors "A transnational terrorist incident in a country involves victims, perpetrators, targets, or institutions of another country."(Page 231)

[Freytag et al \(2011\)](#) are of the view that socio-economic development should not be taken too lightly while assessing the impact of terrorism on economy. According to them, there are many social, economic and political reasons behind terrorism but religious conflicts are a prominent reason and cannot be ignored. Their empirical analyses concentrated on socio-economic situations of 110 countries between 1971 and 2001. They found that poor socio-economic conditions provide more attractive circumstances for terrorist activities which result in destruction of political, economic and social activities and bring an overall loss to economic growth. Regarding religion as a reason for terrorism, religious differences and fractionalization into sects is a major cause of terrorism in Islamic countries. Their overall results indicated that consumption level, trade openness and investment (both domestic and foreign) get affected by terrorism and overall growth gets negatively affected.

[Caruso and Schneider \(2011\)](#) empirically investigated the socio-economic determinants of terrorism and political violence in Western Europe by taking a sample of 12 Western European countries from 1994-2007. They argued that poor economic conditions and lack of economic opportunities are likely to increase terrorist activities and political violence. According to this study, larger the set of economic opportunities for an individual, the lower would be likelihood for that individual for involving in terrorist activities. Empirical results show that if GDP per-capita increases by 1 percent, the expected number of terrorist incidents would decrease by 3.5 percent while increase of 1 percent in youth unemployment would translate into 0.5 percent increase in terrorist activity. According to their findings, frustration and poor economic expectations fuel terrorist activity. Terrorist brutality measured in the number of victims per accident is positively associated with real GDP per-capita and its duration is associated with the continuation of such policies which makes terrorists more brutal for getting more attention.

[Kis-Katos et al \(2011\)](#) in their study analyzed the determinants of the origin of domestic and international terrorism by using a panel data set of 159 countries covering a time period of 1970 to 2007. They conclude that terrorist activities increase as GDP per-capita increases, i.e. healthier countries are more prone to terror. High level of political and civil liberties lead to more brutal terrorism. The authors state that their findings contradict the traditional mindset that terrorism increases due to economic deprivation. On the contrary, they found that “weak or failing states” were an incubator for terrorism and they concluded that reasons for both domestic and international terrorism were the same.

Here I would like to critically analyze the results. If these results are true, then it will not be wrong to conclude that terrorism is equally a threat for developed countries as it is for developing countries. In case of developed countries, stable political conditions result in different kind of brutal terrorism as compared to those countries which have unstable political, economic and social conditions. In both cases, the objective of terrorists is to seek the attention and create fear. For developed countries, their high development status is a threat whereas for developing countries, low level of growth and development is the cause of terrorism. This argument results in inconclusiveness on the part of determinants of terrorism.

[Feldman and Ruffle \(2008\)](#) conducted a comprehensive empirical study to investigate the role of religion and religious ideology on terrorism.

Their findings contradict that terrorism is associated with religiously motivated groups. Keeping other factors constant, they found that religiously motivated groups initiated fewer attacks on average as compared to terrorist groups without religious ideology. According to them, religious diversity motivated religious terrorism without having any effect on the terrorism of communists, nationalists or other ideologies. This finding supports Adam Smith's untested view:

*"Competition would tend to restrain, not encourage, religious fanaticism and intolerance, and ensure that religious sects contributed to "good temper and moderation." (Page 1073)<sup>(15)</sup>*

### **Studies Specific to the case of Pakistan**

Terrorism has affected not only the functioning of economy but it has also exerted adverse effects on socio-political environment and international relations.

According to [Shah \(2014\)](#), terrorism originating from religious sectarianism, particularly between Sunnis and Shias, the age old two sects of Muslims, has given birth to suicide attacks on the worshippers in their respective places of worship and target killing of religious leaders of either sects has gravely affected the security of Pakistan since the last few decades. Naturally it had its adverse effects on the FDI related economic growth.

[Khan \(2016\)](#)<sup>(15)</sup> states that invasion of Afghanistan by Soviet Russia in 1979 brought Saudi Arabia, in addition to US, to the region, which resulted in the growth of Sunni sect, ultimately leading to the rise of Taliban, and overthrow of Monarchy in Iran through revolution in the same year brought Shia sect in the lime light. The sectarian divide between the Shia and Sunni sects in Pakistan, supported respectively by Iran and Saudi Arabia, has ignited sectarian terrorism to the extent that this sectarian conflict is posing danger to the stability of Pakistan, despite the fact that followers of both the sects have lived in peace and harmony in this region for centuries. The author goes to the extent that the present conflict in different countries of the Middle East like Yemen, Iraq, Syria and rise of ISIS is the direct result of the conflict between Saudi Arabia and Iran. Due to this conflict of religious sectarianism, the goal of economic growth could not be achieved which resulted in extreme poverty.

[Abbas \(2010\)](#) is of the view that religious sectarianism in Pakistan has taken a dangerous turn and it has now posed a great threat to both internal and external peace. The author suggests that political and military leaders must promote sectarian harmony which is a pre-requisite for peace in South Asia.

[Zaman \(1998\)](#) has presented his views that Pakistan, which is an Islamic State in a way, in accordance with its Constitution, having the largest Shia population (about 20 percent) after Iran, but is a minority as compared to the Sunni majority (about 80 percent), has to tackle this sectarian conflict, which is part and parcel of its socio-politico-economic life, for its smooth sailing as a state.

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<sup>(15)</sup> Anderson (1988)

According to [Abbasi \(2013\)](#), Pakistan has paid a heavy price as a “Frontline State” in this global war on terrorism lead by US and NATO forces in the form of loss of more than 52000 human lives including civilians and men in uniform between the time span of 2002-2013. In addition, it has also paid and is still paying a direct cost in terms of shock to economic activities, investment inflow, flight of capital and shaken market confidence. It has escalated instability, insecurity and political violence in the country. Militant organizations successfully established close nexus with criminal networks which resulted in increase in the crime rate across Pakistan in the form of sectarian violence, target killing and other forms of terrorism. Due to geographical proximity to Afghanistan, which was the theater of war on terrorism, Pakistan had to suffer not only huge losses in the form of human lives but also the massive damage to its infrastructure.

According to [Clarke \(2011\)](#), in case of Pakistan, religion has entered into politics resulting in extremism and sectarianism. In political arena, Islamist parties receive more support from middle and lower classes as compared to high income entrepreneurs. This conflict is intensifying sectarian conflict leading to violence especially in the most crowded city of Pakistan which is also an economic hub in the sense that it is the largest city with seaport having a huge industrial set up – Karachi. All this is having a negative influence on economic growth as the determinants of economic growth particularly FDI inflows are being negatively affected.<sup>(16)</sup>

In the foregoing discussion, mainly two major Muslim sects i.e. Shias and Sunnis have been mentioned though amongst the Sunnis there are other sub-sects like Ahle-Hadis (also called Wahabis), Deobandis and Brelvis etc. and similarly sub-sects are also existing amongst the Shias. Occasionally some scuffles take place between the Ahle-Hadis/Deobandis and Brelvis. In order to avoid digression from the main topic of my paper, I have avoided going into details of the conflicts amongst these sub-sects. Moreover, amongst the Muslims, Shias and Sunnis are the main sects since centuries and these exist in the whole Muslim world.

After highlighting the nature and extent of religious sectarianism in Pakistan, now I proceed to review of literature pertaining to impact of terrorism on FDI inflows, economic growth and their relationship along-with the methodology used by other researchers and the conclusions drawn by them in this respect, since I have also to undertake empirical analysis of my study.

According to [Shehbaz et al \(2013\)](#), Pakistan receives a huge amount of FDI inflows which affects economic growth. Authors have mentioned a proper mechanism through which terrorism affects FDI inflows and then economic growth; terrorism directly causes the loss of human and capital resources resulting in a negative impact on three main actors of economy i.e. consumer, producer and chiefly the investor. This hurts investor’s confidence and low FDI inflows act as a shock on economic growth.

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(16) For details see Chapter 7

[Haider and Anwar \(2014\)](#), conducted a time series regression analysis on Pakistan's data covering the time period of July 2001 to November 2011. They applied the econometric technique of ARMAX to examine the impacts of terrorism on FDI inflows to Pakistan. Their study found that terrorist violence reduces FDI inflows and affects Pakistan's economy negatively leading to reduction in growth indicators.

[Rasheed and Tahir \(2012\)](#), used the empirical technique of Granger Causality test on Pakistan's data ranging 2003 till 5<sup>th</sup> June 2011 and concluded that an increase in terrorist activities leads to reduction in FDI inflows. The authors state that because of terrorism, FDI decreases since investors lose their confidence and fear that their investment might suffer losses. This has spillover effects on economic growth. Authors also claim that after analyzing the results of their study, this relation does not only exist for Pakistan but any country would face same consequences as a result of terrorist activities/terrorism.

[Ali et al \(2015\)](#), carried out an empirical study to investigate the impact of terrorism on FDI inflows in Pakistan. According to this study, terrorism can affect economy in various ways which include damage of human and physical capital, increasing the factor of risk and uncertainty, diversion of resources from productive activities towards defense expenditures and counter terrorism <sup>(17)</sup>, and bringing harm to industrial sector specially tourism industry <sup>(18)</sup>. All these consequences disrupt socio-economic conditions leading to low economic growth. After applying the econometric technique of autoregressive distributive lag model using the data of Pakistan from 1989-2014, the results confirm that terrorism negatively affects FDI inflows in Pakistan.

[Rauf et al \(2016\)](#) explain the importance of FDI inflows towards developing countries; it reduces saving-investment gap, brings new technology and technical know-how, creates jobs and reduces unemployment. They conducted an empirical study to measure the impact of terrorism and political stability on FDI inflows in Pakistan. After applying OLS method on secondary annual data of Pakistan from 1970-2013, their empirical findings suggest that GDP (measure of economic growth), trade openness and political stability have positive and significant impact on FDI whereas terrorism has a negative influence on FDI inflows and growth. They used the data of number of bomb blasts in Pakistan to measure terrorist activity (including all motives behind bomb blasts; religious, political, social, others).

According to [Farooq and Shehzad \(2016\)](#), terrorism is a means of imposing your ideas (terrorist) on others to achieve their goals. There are many reasons for terrorism like social and economic factors, political issues, religious differences and extremism.

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(17) Initially mentioned in Joint Economic Committee, & Congress, U. S. (2002).

(18) Initially mentioned in Abadie and Gardeazabal (2008)

They add that although there are many determinants of growth in Pakistan but FDI inflows is the most important source of growth rate. They carried out an empirical analysis by using OLS method on data of Pakistan from 1973-2013 and found that FDI inflows have a positive and significant impact on growth rate whereas terrorism is adversely affecting the economy. Moreover, it is discouraging FDI inflows therefore government must adopt such policies which could curb terrorism and increase FDI inflows in the country.

[Zeb et al \(2013\)](#) conducted an empirical study on the role of foreign direct investment in economic growth of Pakistan. They took three variables; trade openness, political instability and terrorist attack. After applying OLS model using time series data of Pakistan from 1972 – 2012 and found that FDI inflows positively affect growth rate but due to defense expenditures, FDI is not proving fruitful to the required level. Therefore, government must give attention to policy measures for reducing all kinds of terrorist attacks.

[Ali and Gang \(2016\)](#), have conducted a study giving a complete analysis of current issues of Pakistan and their relationship with economic growth. According to this study, terrorism and bad security conditions have been hindering the relationship between FDI and economic growth of Pakistan. A favorable investment environment is necessary for attracting FDI inflows which could lead to an improvement in economic growth but in case of Pakistan, factors like poor law and order condition, energy crises, corruption, political instability and most importantly security conditions play a negative role. The authors claim that now environment is improving and FDI inflows are increasing leading to higher economic growth and CPEC is the largest evidence that Pakistan is moving towards better policy measures which are creating favorable environment for foreign investment and major credit goes to Operation Zarb-e-Azab (army operation) to fight terrorism.

A similar conclusion has been drawn by [Shehzad et al \(2016\)](#), who conducted a study to find out a relationship between FDI, terrorism and economic growth in Pakistan analyzing the situation and data of pre 9/11 and post 9/11 incident. The results suggest that terrorism has negatively affected FDI inflows and economic growth post 9/11 which shows that government should take steps for controlling terrorist activities. The authors suggest that although government has launched a big military operation, yet more measures are required specially for handling the root causes of terrorism like poverty, illiteracy, unemployment, sectarianism and ethnicity etc.

## **2.4 DISCUSSION OF THE LITERATURE AND OWN REASEARCH ENDEAVOR**

Numerous studies have been analyzed in the literature review throwing light on each variable (religious sectarianism, FDI inflows, economic growth and terrorism) separately as well as their combined effect. History of religious sectarianism in Pakistan goes back to the period of Zia-ul-Haq (1977) but this gained hype at global level after the terrorist attacks of 9/11 in US. Many authors have analyzed the relationship between FDI inflows and terrorism and as expected, their findings suggest that terrorism decreases FDI inflows. The relationship between economic growth and terrorism has also been debated and researchers have a consensus that terrorist activities decrease econom-



ic growth. Both national and international level studies have been included in the literature review to have a deep insight of the subject.

On the other hand, these studies regarding relationship between FDI inflows and economic growth give different results. Some studies confirm a positive relation while others say that FDI inflows decrease economic growth by crowding out domestic investment and factor of competition between international and domestic industries leads to decline in economic growth. In addition, some studies give inconclusive results.

The most important part in the entire discussion is related to religious sectarianism which is mainly causing terrorism in Pakistan. Not much empirical studies are available on this topic which connect religious sectarianism with terrorism and further with FDI inflows and economic growth. Religious sectarianism has been discussed theoretically by most of the researchers but there are many studies available which discuss general terrorism and have carried out empirical analysis investigating the relationship between FDI inflows and economic growth specially emanating from the horrible occurrence of 9/11 in US.

The present study has made an attempt to fill this gap by taking religious sectarianism and connecting it to terrorism in Pakistan. Moreover, its impact on FDI lead economic growth has been investigated empirically.

### **3. DATA AND METHODOLOGY**

This study uses time series data of Pakistan for the period of 1989 – 2016. The values of 2016 are till 31<sup>st</sup> July as the study is being conducted in the same current year.

#### **3.1) Variables to be used**

- (i) Gross domestic product (GDP).
- (ii) FDI inflows.
- (iii) Sectarian violence as a measure of terrorism.

#### **3.2) Units of data and sources**

- (i) GDP is in current US dollars
- (ii) FDI inflows is in BoP current US dollars.
- (iii) Sectarian violence is taken as number of incidents.

Data for GDP and FDI inflows has been retrieved from World Development Indicators (WDI).

Data for Sectarian violence has been taken from South Asia Terrorism Portal (SATP).

### 3.3) Rationale behind choosing these variables

According to [Lequiller \(2005\)](#), as growth means expansion and improvement, then GDP is a very satisfactory measure of growth.

Many other studies, mentioned in literature review have also taken GDP as a measure of economic well-being. Another addition has been made by the [Investopedia Staff \(2015\)](#) <sup>(19)</sup>, according to which GDP is one of the major indicators used to measure the health of a country's economy.

The rationale behind using sectarian violence data is due to its relation with terrorist activities in Pakistan on account of religious extremism and division of Muslims into different sects. This is the oldest form of terrorism in Pakistan and still the most important root cause behind large number of terrorist activities.

### 3.4) Log-Linear Model

This study uses log-linear model (each variable is converted into logarithms of original values). Most empirical studies use this methodology for example [Broekel and Brenner \(2011\)](#) conducted an empirical study using set-ups for four German industries. They used log-Linear model as according to them, this model performs better with regard to empirical analysis.

Another study by [Mayr and Ulbricht \(2007\)](#) states that the classical econometrics approaches provide better results if data is transformed into logarithms specially in case of time series to overcome the detrimental effects of heteroscedasticity and skewness in the level data on estimating and testing.

*As the present study is also based on time series data, therefore all variables are used in their log forms.*

### 3.5) Abbreviations

GDP = Economic growth

FDI = Foreign direct investment inflows

ST = Sectarianism (sectarian violence) as a measure of terrorism

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(19) <http://www.investopedia.com/ask/answers/199.asp>



### 3.6) Tests to be applied

- (i) Augmented Dicky-Fuller (ADF) and Kwiatkowski-Pillips-Schmedt-Shin (KPSS) tests for stationarity (unit root).
- (ii) Johansen- Cointegration test for testing long run Cointegration.
- (iii) Vector Error Correction Model (VECM or ECM) or VAR (Vector Autoregressive Model) depending on results of Johansen test. It is conducted for removing any errors and for studying both short run and long run causality between dependent and independent variables.
- (iv) Impulse response functions.
- (v) Variance decomposition.
- (vi) System equation model.
- (vii) Wald test for weak exogeneity.
- (viii) VEC Granger Causality/Block exogeneity Wald test.

*NOTE: AS DATA IS SAME, UNIT ROOT TEST AND JOHANSEN TEST RESULTS WILL BE REPRESENTING BOTH MODELS, VECM AND SYSTEM EQUATION MODEL WILL BE INDIVIDUALLY CARRIED OUT BASED ON CHANGE IN DEPENDENT VARIABLE.*

### 3.7) Justifications for tests to be applied

[Said and Dickey \(1984\)](#) have discussed the importance of unit root tests. According to them, as time series data is marked with the presence of unit root i.e. series is not stationary. Series can be made stationary by taking differences (1<sup>st</sup>, 2<sup>nd</sup> etc.) and this is possible through unit root tests.

[Granger \(1986\)](#) explains the importance of unit root tests with the help of an example that if a single series appears to be ‘stationary’, then it means that it possesses “linear properties” and such series are called I(0) denoting ‘integrated of order zero’. If series are not stationary and needs to be differenced to achieve the properties of linearity, then it will be integrated of order one denoted by I(1). To continue further testing, all series must have same order of integration. To be stationary, a series must fluctuate around its mean value.

In a detailed study by [Sjö \(2008\)](#), author highlights the importance of Dickey-Fuller (DF) test that in case of time series data, DF test not only indicated the stationarity status of series but the non-stationary ones can be converted into stationary series after taking differences. This is the first step in time series analysis. After DF test, for checking cointegration relationship,

*“The superior test for Cointegration is Johansen test”. (Page 13)<sup>(20)</sup>*

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(20) Sjö (2008)

Johansen Cointegration test is preferred to check the long-run relationship between or among series but this test has a weakness that it relies on asymptotic properties <sup>(21)</sup>, making it sensitive to specification error <sup>(21)</sup> in limited tests. Therefore for removing errors and estimating both long run and short run relationships, Error Correction Model or Vector Error Correction Model (VECM) is applied where D in all equations shows short run relations and coefficients without D show long run relationships (D means difference).

According to [Mitchell \(2000\)](#), Impulse response analysis is extensively used in empirical analysis to identify the responses of the dependent variable in the VAR models to measure the shock of one variable on another. It can be applied to both unrestricted VAR and restricted VAR (VAR with error correction term or VECM). If the evidence of Cointegration is found in the data, the impulse response analysis is applied on VECM with the lag length and cointegrating equations are fixed as obtained in Johansen Cointegration test.

The importance of Impulse function has been explained by [Lin \(2006\)](#) <sup>(22)</sup>, it cannot be explained in better words as it has already been explained in paper, therefore citing original words,

*“Structural VAR embeds economic theory within time series models, providing a convenient and powerful framework for policy analysis. Impulse response function (IRF) tracks the impact of any variable on others in the system. It is an essential tool in empirical causal analysis and policy effectiveness analysis”. (Page 1)*<sup>(23)</sup>

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(21) *Asymptotic theory, or large sample theory, is a generic framework for assessment of properties of estimators and statistical tests. Within this framework it is typically assumed that the sample size  $n$  grows indefinitely, and the properties of statistical procedures are evaluated in the limit as  $n \rightarrow \infty$ .*

(22) *In the context of a statistical model, specification error means that at least one of the key features or assumptions of the model is incorrect. In consequence, estimation of the model may yield results that are incorrect or misleading. Specification error can occur with any sort of statistical model, although some models and estimation methods are much less affected by it than others. Estimation methods that are unaffected by certain types of specification error are often said to be robust. For example, the sample median is a much more robust measure of central tendency than the sample mean because it is unaffected by the presence of extreme observations in the sample.*

*SOURCES: Online encyclopedias*

(23) *For details see, Lin (2006)*

Regarding exogeneity test, [Julius \(2006\)](#) has explained its importance and the reason why this test should be applied. According to author, to check whether a variable of interest affects other variables in long run without getting influenced itself is important in relation to check the validity and it can be checked by using the hypothesis of “no levels feedback” or long run weak exogeneity.

### 3.8) The Models (statistical representation)

This study estimates two models. In the first model FDI is regressed on growth and ST,

#### Equation for first model

**Hypothesis:** FDI inflows have a positive relation with economic growth and a negative relation with sectarian terrorism.

$$FDI = f(GDP, ST)$$

$$FDI = \beta_0 + \beta_1 (GDP) + \beta_2 (ST) + \mu_t \quad \text{where } \mu_t \text{ is a random error term}$$

In the first model FDI is dependent variable whereas GDP and ST are independent variables.

#### Equation for second model

**Hypothesis:** Economic growth has a positive relation with FDI inflows and a negative relation with sectarian terrorism.

$$GDP = (FDI, ST)$$

$$GDP = \beta_0 + \beta_1 (FDI) + \beta_2 (ST) + \mu_t \quad \text{where } \mu_t \text{ is a random error term}$$

In second model GDP is a dependent variable whereas FDI and ST are independent variables.

The **purpose** of having two models and testing two regressions is to determine a two-way causation between FDI and growth are being affected by sectarian terrorism.

## 4. EMPIRICAL ANALYSIS

### 4.1) UNIT ROOT TEST (SAME FOR BOTH MODELS)

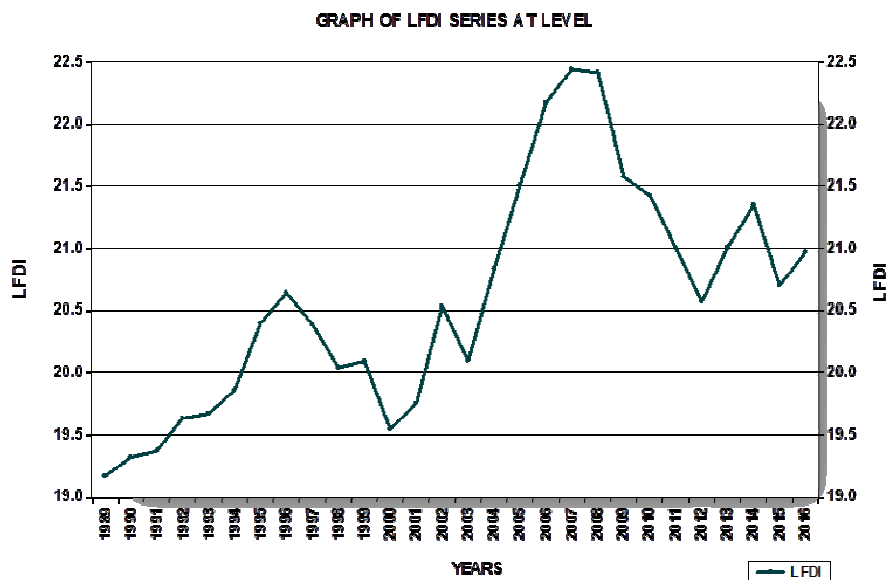
As mentioned earlier, first step in conducting empirical study using time series data is to check the stationarity status through unit root test. This will be shown both graphically and empirically using ADF and KPSS tests. ADF test has a null hypothesis of non-stationarity whereas KPSS test is the opposite of ADF test, i.e., null hypothesis states

that series is stationary (there is no unit root). The main reason behind applying two opposite tests to have a cross-check about stationarity status of data.

### **VISUAL REPRESENTATION OF DATA AT LEVEL**

Visual representation also known as graphical presentation gives a quick idea about stationarity status of data. Also it can be easily observed whether the data has any time trend or deterministic trend which makes it easier to decide for further tests to be applied. According to graphical representation, the movement of all series shows that there is a deterministic trend present and series are not fluctuating around their mean value. Therefore all series have a unit root (non-stationary) at level. Whereas, at first difference, all series become stationary without any trend element present anymore. All graphs at first difference show that the series are moving around their mean value (zero). The graph area of all series is evenly divided and it covers all values.

**GRAPH- 3 SERIES OF LFDI (Log FDI) AT LEVEL**

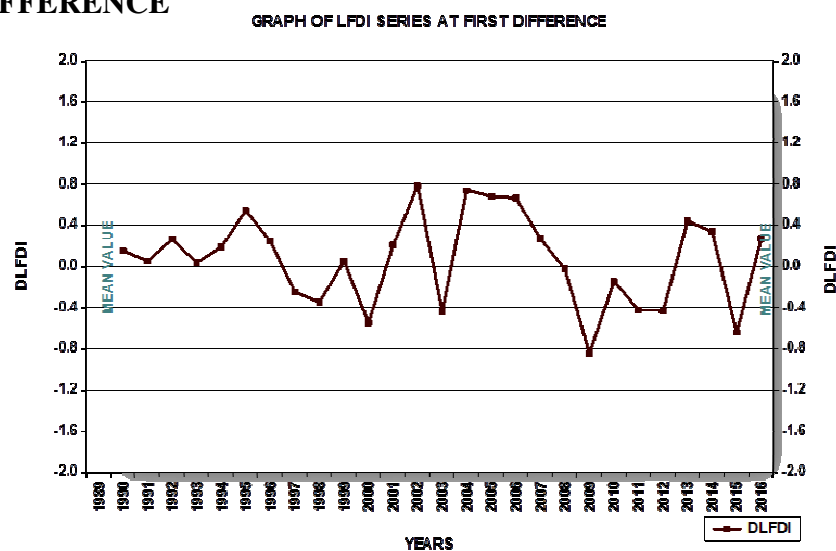


DATA SOURCE: WORLD DEVELOPMENT INDICATORS

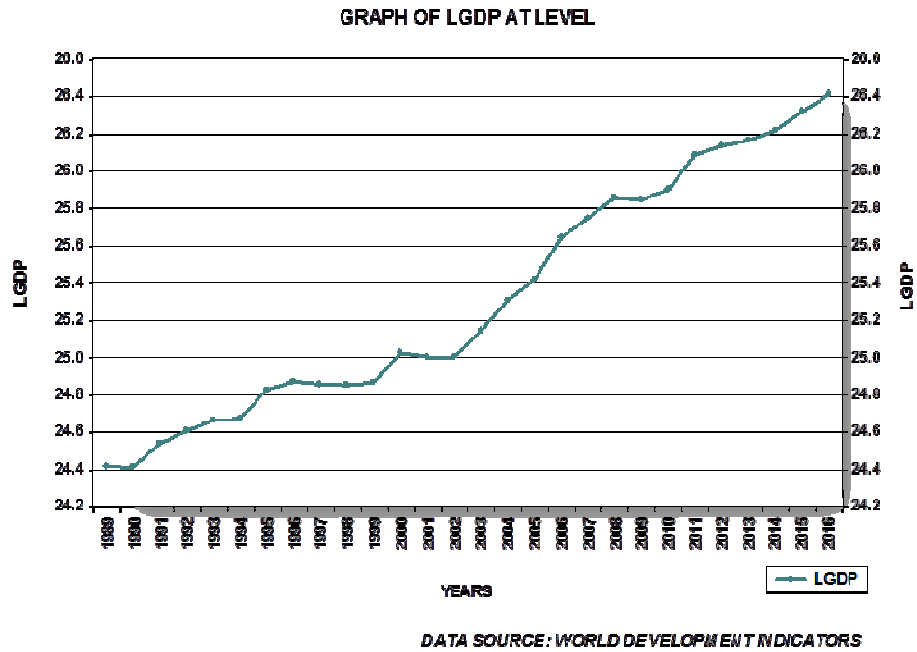
**GRAPH-4 SERIES OF LFDI (Log**

**FDI) AT**

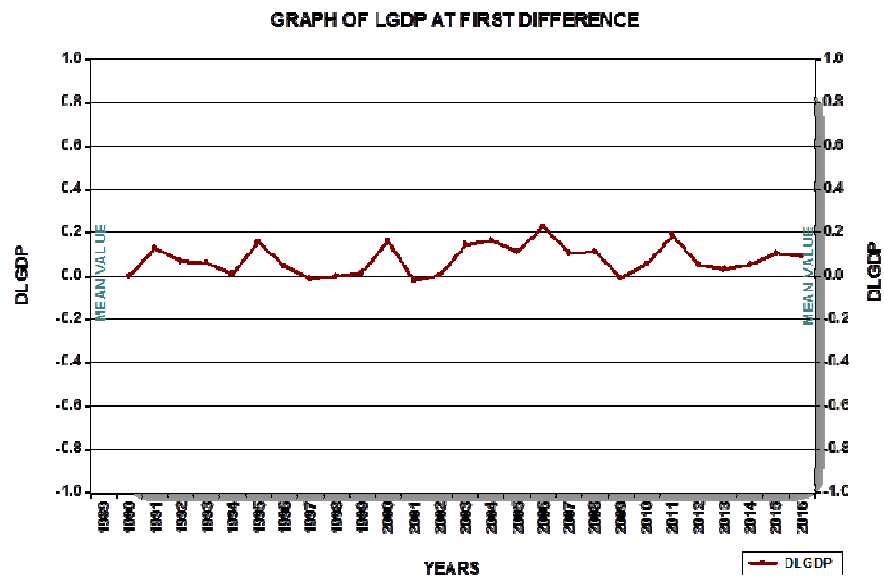
**FIRST DIFFERENCE**



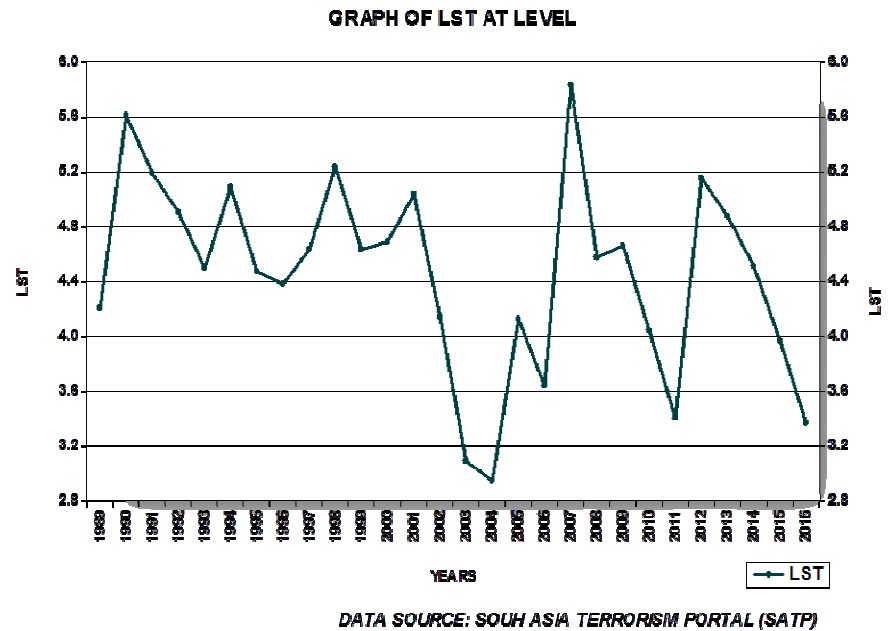
**GRAPH- 5 SERIES OF LGDP (Log GDP) AT LEVEL**



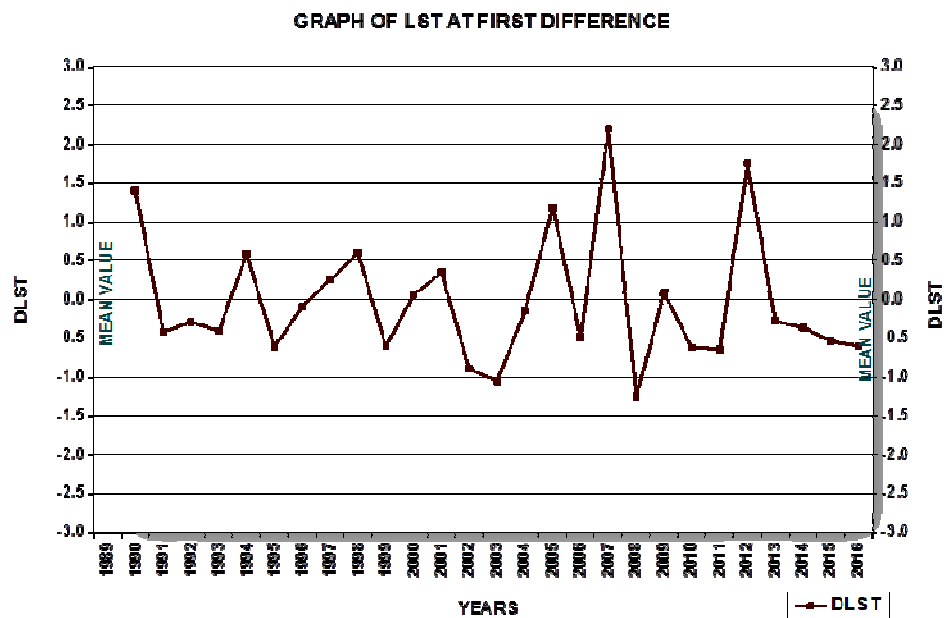
**GRAPH- 6 SERIES OF LGDP (Log GDP) AT FIRST DIFFERENCE**



**GRAPH- 7 SERIES OF LST (Log ST) AT LEVEL**



**GRAPH-8 SERIES OF LST (Log ST) AT FIRST DIFFERENCE**



In the next part, ADF test shows the t-values of series both at level and at first difference. As the series include trend component, all series are tested on the basis of two main components; (i) trend and intercept, (ii) none. After applying ADF test, KPSS is also carried out to have a cross check. After checking stationarity status of data, further relevant tests have been conducted using econometric software Eviews 7. Each test has been explained completely including its characteristics and results have been discussed side by side.

**TABLE-2 ADF TEST STATISTIC (*t*-values)**  
**EMPIRICAL RESULTS**

VARRIBALES	AT LEVEL		AT FIRST DIFFERENCE		ORDER OF INTERGRATIO N
COMPONENTS OF EQUATION	TREND AND INTERCEPT	INTERCEPT	TREND AND INTERCEPT	INTERCEPT	
LFDI	-1.601	-1.726	- 4.311***	- 4.319***	I(1)
LGDP	-1.760	0.645*	- 4.669***	- 4.707***	I(1)
LST	-3.948**	-3.456**	- 7.001***	- 7.160***	I(1)

Source: Author(s)

- Null Hypothesis ( $H_0$ ): Series has a Unit Root (non- stationary)
- If t-values (absolute or positive) are greater than critical values at 1%, 5% and 10%, Null hypothesis ( $H_0$ ) is rejected i.e., series does not have unit root (it is stationary)

*\*significant at 10% level of significance*

*\*\*significant at 5% level of significance*

*\*\*\* Significant at 1% level of significance*

Test details:-

- Lag Length : Schwarz Info Criterion (Automatic)  
: Maximum Lags 6 (Automatic)
- Probability criterion :MacKinnon (1996) one-side p-values

**TABLE-3 KPSS (Kwiatkowski-Pillips-Schmedt-Shin) TEST STATISTIC (*LM-stat*)**

VARRIBALES	AT LEVEL		AT FIRST DIFFERENCE		ORDER OF INTERGRATIO N
COMPONENTS OF EQUATION	INTERCEPT	TREND AND INTERCEPT	INTERCEPT	TREND AND INTERCEPT	
<b>LFDI</b>	<b>0.458<sup>**</sup></b>	<b>0.926<sup>*</sup></b>	<b>0.124</b>	<b>0.072</b>	<b>I(0)</b>
<b>LGDP</b>	<b>0.66<sup>**</sup></b>	<b>0.136<sup>**</sup></b>	<b>0.180</b>	<b>0.079</b>	<b>I(0)</b>
<b>LST</b>	<b>0.310<sup>*</sup></b>	<b>0.0963<sup>*</sup></b>	<b>0.101</b>	<b>0.067</b>	<b>I(0)</b>

**EMPIRICAL RESULTS**

Source: Author(s)

- Null Hypothesis ( $H_0$ ): Series is stationary (absence of unit root).
- If LM-stat value is less than critical values at 1%, 5% and 10%, Null hypothesis ( $H_0$ ) is accepted i.e., series does not have unit root (it is stationary)

*\*significant at 10% level of significance*

*\*\*significant at 5% level of significance*

*\*\*\* Significant at 1% level of significance*

Test details:-

- *Spectrum Estimation Method: Barlett Kernel (Default)*
- *Bandwidth : Newey-West Bandwidth (Automatic)*
- *Lag Length : 3 (Automatic)*

**NOTE:** AT 10 % LEVEL, ALL SERIES ARE FOUND TO BE STATIONARY IN BOTH ADF AND KPSS TESTS

In a tutorial on Eviews by [Batchelor \(2000\)](#), when all series have same level of integration then Johansen Cointegration test is applied and if there exists Cointegration (presence of long run relationship) then later VECM is applied for studying short run relationship. But if Johansen tests concludes that there is no Cointegration or long run relationship, then VAR model is applied. Johansen test is always applied at level.



**TABLE- 4 JOHANSEN COINTERGRATION TEST FOR BOTH MODELS**

(i) Using LFDI and LGDP

**TRACE TEST (RESULTS)**

Sample (adjusted): 1992 2016

Included observations: 25 after adjustments

Trend assumption: Linear deterministic trend

Series: LFDI LGDP

Lags interval (in first differences): 1 to 2

## Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.493412	17.79463	15.49471	0.0221
At most 1	0.031230	0.793198	3.841466	0.3731

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**MAXIMUM EIGEN VALUE TEST (RESULTS)**

## Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.493412	17.00144	14.26460	0.0180
At most 1	0.031230	0.793198	3.841466	0.3731

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

### UNRESTRICTED COINTEGRATING COEFFICIENTS

Unrestricted Cointegrating Coefficients (normalized by $b'S_{11}b=1$ ):		
LFDI	LGDP	
-1.514943	0.433865	
1.367215	-2.967305	
Unrestricted Adjustment Coefficients (alpha):		
D(LFDI)	0.257453	-0.037747
D(LGDP)	-0.015494	-0.010388
1 Cointegrating Equation(s):	Log likelihood	28.55066
Normalized cointegrating coefficients (standard error in parentheses)		
LFDI	LGDP	
1.000000	-0.286390	
	(0.29341)	
Adjustment coefficients (standard error in parentheses)		
D(LFDI)	-0.390027	
	(0.11718)	
D(LGDP)	0.023472	
	(0.02115)	

As ADF and KPSS test show there are three non-stationary  $I(1)$ , applying the test again to check if there is a second cointegration.

### TRACE TEST (RESULTS)

Sample (adjusted): 1992 2016				
Included observations: 25 after adjustments				
Trend assumption: Linear deterministic trend				
Series: LFDI LGDP LST				
Lags interval (in first differences): 1 to 2				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.656177	43.16698	29.79707	0.0008
At most 1 *	0.448725	16.47626	15.49471	0.0355
At most 2	0.061552	1.588207	3.841466	0.2076
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

### MAXIMUM EIGEN VALUE TEST (RESULTS)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.656177	26.69072	21.13162	0.0074
At most 1 *	0.448725	14.88805	14.26460	0.0398
At most 2	0.061552	1.588207	3.841466	0.2076

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level  
 \* denotes rejection of the hypothesis at the 0.05 level  
 \*\*MacKinnon-Haug-Michelis (1999) p-values

### UNRESTRICTED COINTEGRATING COEFFICIENTS

Unrestricted Cointegrating Coefficients (normalized by b*S11*b=I):			
LFDI	LGDP	LST	
1.220546	0.205491	2.386885	
1.079404	-0.760208	-1.920923	
-1.403775	2.950652	-0.143124	

Unrestricted Adjustment Coefficients (alpha):			
D(LFDI)	-0.263882	-0.080749	0.045702
D(LGDP)	0.003499	0.027968	0.010117
D(LST)	-0.213800	0.150127	-0.122108

1 Cointegrating Equation(s):	Log likelihood	15.64858
------------------------------	----------------	----------

Normalized cointegrating coefficients (standard error in parentheses)		
LFDI	LGDP	LST
1.000000	0.168360	1.955588
	(0.30603)	(0.43566)

Adjustment coefficients (standard error in parentheses)	
D(LFDI)	-0.322080
	(0.08628)
D(LGDP)	0.004270
	(0.01729)
D(LST)	-0.260952
	(0.16652)

2 Cointegrating Equation(s):	Log likelihood	23.09260
------------------------------	----------------	----------

Normalized cointegrating coefficients (standard error in parentheses)		
LFDI	LGDP	LST
1.000000	0.000000	1.234954
		(0.34848)
0.000000	1.000000	4.280324
		(0.91413)

Adjustment coefficients (standard error in parentheses)	
D(LFDI)	-0.409240
	(0.11067)
	0.007161
	(0.05349)

D(LGDP)	0.034459 (0.02027)	-0.020542 (0.00980)
D(LST)	-0.098904 (0.21423)	-0.158062 (0.10354)

## INTERPRETATION OF RESULTS

In both tests, there are two hypothesis

Null Hypothesis: There is no Cointegration

Alternate Hypothesis: There is Cointegration

Johansen Cointegration test has been applied twice to check if the results give a second Cointegration. The first one indicates that both trace test and maximum Eigen values test statistics have one Cointegrating equation. Moreover it is applied using only LFDI and LGDP. In second case, all three variables (LFDI, LGDP, and LST) are taken and results show that there are two Cointegrating equations. In both cases, number of Cointegrating equations is less than the number of variables. Since there is evidence of presence of Cointegration, VECM is applied instead of VAR.

As there are two models; first one uses FDI as dependent Variable and second model uses GDP as dependent variable. VECM is applied for both models separately

## 5. VECM FOR MODEL 1

**TABLE- 5 VECTOR ERROR CORRECTION MODEL (VECM)**

### Test Details

- LFDI is the dependent variable whereas LGDP and LST are independent variables.
- VECM automatically creates first difference of data.
- As Johansen Cointegration test suggested two cointegrating equations, number of cointegration has been manually set at 2.
- The number of coefficients are always equal to P-values but P-values are not shown in VECM
- Var type; Vector Error Correction.
- Lag Interval for Endogenous: 1 2
- Endogenous Variables: LFDI LGDP LST

Vector Error Correction Estimates			
Sample (adjusted): 1992 2016			
Included observations: 25 after adjustments			
Standard errors in ( ) & t-statistics in [ ]			
Cointegrating Eq:	CointEq1	CointEq2	
LFDI(-1)	1.000000	0.000000	
LGDP(-1)	0.000000	1.000000	
LST(-1)	1.234954 (0.35920) [ 3.43804]	4.280324 (0.94226) [ 4.54262]	
C	-26.20168	-44.47661	
Error Correction:	D(LFDI)	D(LGDP)	D(LST)
CointEq1	-0.409240 (0.11408) [-3.58739]	0.034459 (0.02089) [ 1.64948]	-0.098904 (0.22082) [-0.44789]
CointEq2	0.007161 (0.05513) [ 0.12988]	-0.020542 (0.01010) [-2.03455]	-0.158062 (0.10673) [-1.48101]
D(LFDI(-1))	-0.008352 (0.19642) [-0.04252]	0.054365 (0.03597) [ 1.51138]	-0.360561 (0.38022) [-0.94829]
D(LFDI(-2))	0.048690 (0.18546) [ 0.26253]	0.000501 (0.03396) [ 0.01474]	-0.187439 (0.35900) [-0.52211]

D(LGDP(-1))	0.789847 (1.35956) [ 0.58096]	-0.092226 (0.24897) [-0.37042]	4.206466 (2.63173) [ 1.59837]
D(LGDP(-2))	1.950521 (1.49791) [ 1.30216]	-0.602770 (0.27431) [-2.19741]	2.885937 (2.89953) [ 0.99531]
D(LST(-1))	0.450174 (0.17302) [ 2.60187]	0.045745 (0.03168) [ 1.44376]	0.110609 (0.33492) [ 0.33026]
D(LST(-2))	0.213332 (0.14351) [ 1.48652]	-0.013392 (0.02628) [-0.50958]	0.328920 (0.27780) [ 1.18402]
C	-0.113688 (0.15788) [-0.72009]	0.125540 (0.02891) [ 4.34213]	-0.562657 (0.30561) [-1.84110]
R-squared	0.615355	0.432972	0.553460
Adj. R-squared	0.423033	0.149459	0.330190
Sum sq. resids	1.960743	0.065755	7.346947
S.E. equation	0.350066	0.064107	0.677631
F-statistic	3.199600	1.527165	2.478884
Log likelihood	-3.654058	38.78515	-20.16608
Akaike AIC	1.012325	-2.382812	2.333286
Schwarz SC	1.451120	-1.944016	2.772081
Mean dependent	0.064002	0.074945	-0.073026
S.D. dependent	0.460866	0.069512	0.827976
Determinant resid covariance (dof adj.)		0.000121	
Determinant resid covariance		3.16E-05	
Log likelihood		23.09260	
Akaike information criterion		0.792592	
Schwarz criterion		2.401508	

*D (difference) represents short run relationship*

In VECM, there are three models; D(LFDI), D(LGDP) and D(LST) but D(LFDI) is the main target model as D(LFDI) is the dependent variable but this model does not show P-value (Probability values) for each variable. To find out the P-value of each variable for the main model, system equation is estimated also known as system equation model.

VECM has been applied using two lags. Here D(LFDI) is the dependent variable. It is also the coefficient of CointEq1. There are three models but D(LFDI) is the target model. It is also known as “error correction model”. Also coefficient divided by standard error gives t-value but probability values are required to conclude whether the coefficients are significant or not.

## 6. IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION

### Test Details

- Test is applied on three series LGDP, LFDI and LST.
- Test is applied at levels (instead of differenced co-efficients) to get proper nature of responses.
- As there is an evidence of Cointegration, the responses are checked on restricted VAR (VECM).
- The number of cointegrating equations is set according to the results obtained in Johansen test.
- Default decomposition method of Cholesky – dof adjusted method is used.
- The lag length has been set in accordance of VECM, i.e., 1 2 and responses are checked for the period of 20 years.
- The zero (0) line is the benchmark for measurement.

The results are presented in graph 8.

### INTERPRETATION OF RESULTS

- As impulse response function is a shock to the VAR system, it identifies the responsiveness of the variables in VAR system when a shock is put to the error terms. In this case, impulse response has been analyzed in case of restricted VAR. the effects of all variables is checked in a combine test, therefore this test investigates both models.

- Each graph shows the effect of one standard deviation change in one variable on other.

Generally, along zero line, if one variable moves above the line and other moves down, the variables are moving in opposite direction. If both move above or below zero line with same pattern, it means the reaction is same.

#### (i) Responses of LFDI on other variables.

Initially an increase in LFDI leads to an increase in LGDP and a reduction in LST. Later the response of LFDI to LFDI, LFDI to LGDP and LFDI to LST is almost same in all three graphs and the line moves around the benchmark line.

#### (ii) Responses of LGDP on other variables.

LGDP leads to an increase in LFDI and vice versa whereas LST decreases but after sometime, the line becomes stable still it remains on negative side.

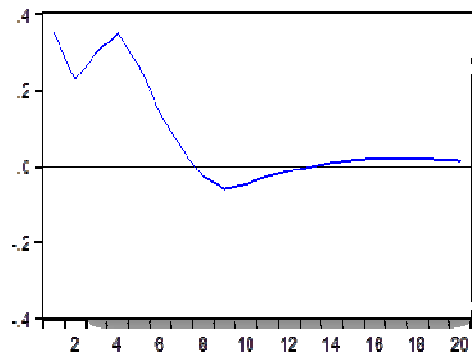
#### (iii) Responses of LST on other variable

The response of ST to LFDI and LST to LGDP is same. LST does not react to LGDP but reacts to LFDI. As LST increases, LFDI decreases.

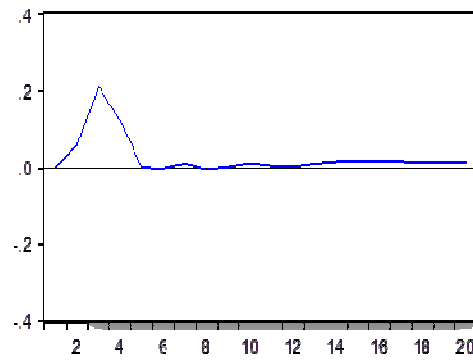
## GRAPH-9 IMPULSE RESPONSES

Response to Cholesky One S.D. Innovations

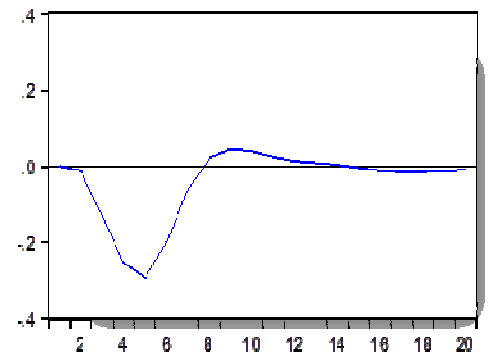
Response of LFDI to LFDI



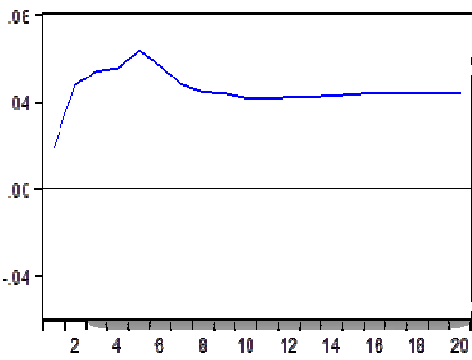
Response of LFDI to LGDP



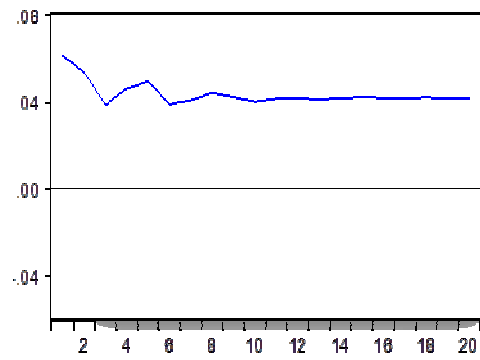
Response of LFDI to LST



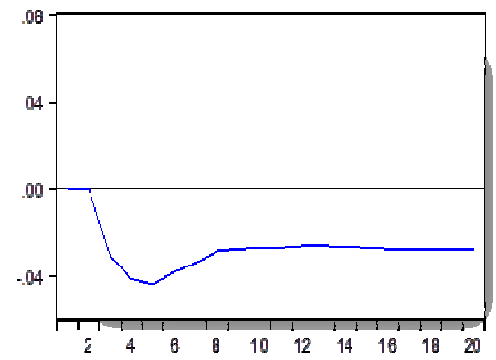
Response of LGDP to LFDI



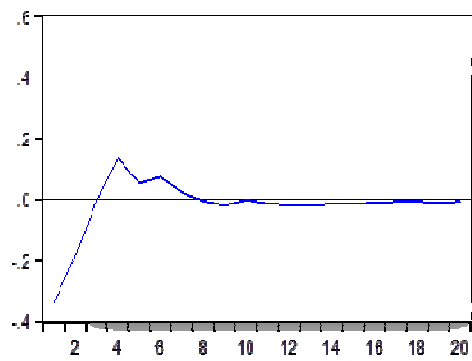
Response of LGDP to LGDP



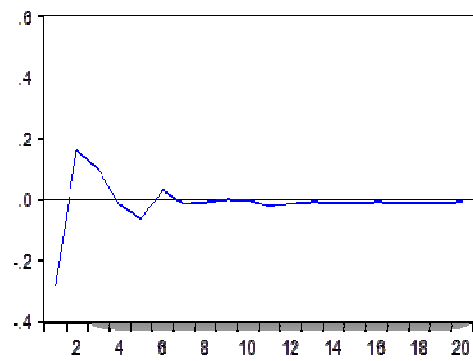
Response of LGDP to LST



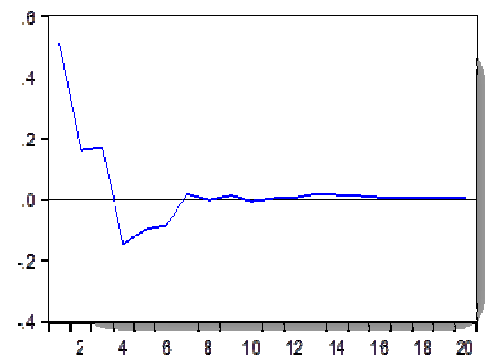
Response of LST to LFDI



Response of LST to LGDP



Response of LST to LST





## VARIANCE DECOMPOSITION

### Test Details<sup>(24)</sup>

- Since impulse response functions trace the impacts of a shock to one endogenous variable on to the other variables in the VAR, *variance decomposition* separates the variation in an endogenous variable into the component shocks to the VAR. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VAR.
- For variance decomposition, all the information must be same as provided in impulse responses. It is normally viewed in table format which displays a separate variance decomposition for each endogenous variable. The second column, labeled “S.E.”, contains the forecast error of the variable at the given forecast horizon. The source of this forecast error is the variation in the current and future values of the innovations to each endogenous variable in the VAR. The remaining columns give the percentage of the forecast variance due to each innovation, with each row adding up to 100.
- As with the impulse responses, the variance decomposition based on the Cholesky factor can change dramatically if a change is made in ordering of the variable of the variables in the VAR. For example, the first period decomposition for the first variable in the VAR ordering is completely due to its own innovation.

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(24) Schwert (2009)

## TABLE-6 VARIANCE DECOMPOSITION OF VARIABLES

(i) VARIANCE DECOMPOSITION OF LFDI

Period	S.E.	LFDI	LGDP	LST
1	0.350066	100.0000	0.000000	0.000000
2	0.421315	98.15578	1.754892	0.089331
3	0.572605	80.13656	14.46038	5.403059
4	0.726800	72.70162	11.74326	15.55512
5	0.826802	66.20156	9.074699	24.72374
6	0.861434	63.46852	8.360408	28.17107
7	0.865009	63.19936	8.305455	28.49519
8	0.865728	63.20280	8.295068	28.50213
9	0.868928	63.22257	8.234226	28.54320
10	0.871154	63.20557	8.207492	28.58694
11	0.871875	63.19362	8.195932	28.61044
12	0.872077	63.18927	8.192456	28.61827
13	0.872174	63.17582	8.203690	28.62049
14	0.872346	63.16157	8.227815	28.61062
15	0.872621	63.15530	8.249083	28.59562
16	0.873050	63.14494	8.269062	28.58600
17	0.873571	63.13147	8.286524	28.58201
18	0.874031	63.11945	8.299411	28.58114
19	0.874381	63.10794	8.312259	28.57980
20	0.874652	63.09673	8.327270	28.57600

**INTERPRETATION OF RESULTS**

- After discussing details of test, the results can be interpreted for both short run and long run time periods. For analysis, short- run time period is analyzed at 6 (6 years) and for long run, the end time is taken, i.e, 20 years. (As data is annual, observations mean years)
- , In short run, impulse or innovation or a shock to LFDI can cause 63.47 percent fluctuation on LFDI which is also called own shock. In case of LGDP, it is 8.36 percent and 28.17 percent fluctuation in LST. Total= 63.47 + 8.36 + 28.17 = 100 percent.
- Now studying long run for making comparison. a shock to LFDI, LGDP and LST in long run can cause 63.09 percent, 8.33 percent and 28.58. Total = 63.09 + 8.33 + 28.48= 99.9 almost 100 percent.
- COMPARISON shows that both in short run and long run, a shock to LFDI cannot contribute much in the fluctuations in LFDI, LGDP and LST (taking both individual and total values).

(ii) VARIANCE DECOMPOSITION OF LGDP

Period	S.E.	LFDI	LGDP	LST
1	0.064107	8.770049	91.22995	0.000000
2	0.096621	28.34759	71.65202	0.000391
3	0.121373	37.79851	55.59318	6.608313
4	0.147208	39.99904	47.60020	12.40076
5	0.173391	42.21449	42.41918	15.36633
6	0.190426	43.83515	39.42652	16.73833
7	0.203483	43.92717	38.57207	17.50076
8	0.214907	43.70667	38.83621	17.45712
9	0.225128	43.65302	38.93461	17.41237
10	0.234139	43.56149	38.97383	17.46468
11	0.242995	43.39831	39.13565	17.46605
12	0.251555	43.33077	39.28267	17.38656
13	0.259815	43.30331	39.36880	17.32789
14	0.267952	43.26558	39.45664	17.27778
15	0.276097	43.24845	39.51166	17.23989
16	0.284093	43.26104	39.51074	17.22822
17	0.291919	43.27238	39.49104	17.23658
18	0.299567	43.27973	39.47741	17.24286
19	0.307016	43.28788	39.46537	17.24675
20	0.314255	43.29274	39.45658	17.25068

#### INTERPRETATION OF RESULTS

- Again short run period is set at 6 years and long run at 20 years.
- In short run, impulse or innovation or a shock to LGDP accounts for 43.85 percent fluctuations in LFDI, 39.43 percent in LGDP (own shock) and 16.74 percent respectively resulting in a total of 100.02, almost 100 percent.
- In long run a shock to LGDP exerts a shock of 43.30 percent on LFDI, 39.46 percent on LGDP (own shock) and a fluctuation of 17.25 percent in LST respectively. Total =  $43.30 + 39.46 + 17.25 = 100.1$  almost 100 percent.
- COMPARISON shows that both in short run and long run, a shock to LFDI cannot contribute much in the fluctuations in LFDI and LGDP but a shock in LST can contribute in the form an increase in long run. If previous years (2, 3, 4 and 5) are observed, they show the same result.

#### (iii) VARIANCE DECOMPOSITION OF LST

Period	S.E.	LFDI	LGDP	LST
--------	------	------	------	-----

1	0.677631	25.05620	17.73258	57.21122
2	0.738922	27.66865	19.53642	52.79494
3	0.764502	25.86068	19.97098	54.16833
4	0.791011	27.14009	18.71083	54.14908
5	0.801539	26.87395	18.89749	54.22856
6	0.809867	27.12238	18.65459	54.22303
7	0.810495	27.15545	18.65721	54.18734
8	0.810588	27.15513	18.66889	54.17599
9	0.810944	27.19487	18.65258	54.15255
10	0.810976	27.19407	18.65183	54.15410
11	0.811455	27.19387	18.71377	54.09236
12	0.811823	27.22548	18.72661	54.04791
13	0.812334	27.25235	18.71590	54.03175
14	0.812692	27.26820	18.71368	54.01812
15	0.812999	27.28330	18.71764	53.99906
16	0.813136	27.29112	18.72163	53.98725
17	0.813260	27.29375	18.73038	53.97587
18	0.813383	27.29628	18.74077	53.96295
19	0.813514	27.30053	18.74873	53.95073
20	0.813639	27.30489	18.75553	53.93958

## INTERPRETATION OF RESULTS

- In case of LST also, short run period is set at 6 years and long run at 20 years.
- In short run, impulse or innovation or a shock to LST contributes to 27.12 percent shock to LFDI, 18.65 to LGDP and 54.22 to LST (own shock). Total = 27.12 + 18.65 + 54.22 = 99.99 again almost 100 percent.
- In long run a shock to LST exercises a shock of 27.30 percent on LFDI, 18.76 percent on LGDP and a fluctuation of 53.94 percent in LST respectively. Total = 27.30 + 18.76 + 53.94 = 100 percent
- COMPARISON shows that both in short run and long run, a shock to LST cannot contribute much in the fluctuations in LFDI and LGDP but a shock in LST can contribute with a slight change in value in the form a decrease in long run. If previous years (2, 3, 4 and 5) are observed, they show the same result for other variables too but the effect is very small.

*NOTE: The effects of all variables is checked in a combine test, therefore this test investigates both models.*

Cholesky Ordering: LFDI LGDP LST

**TABLE-7 SYSTEM EQUATION MODEL**

Dependent Variable: D(LFDI)

Method: Least Squares				
Sample (adjusted): 1992 2016				
Included observations: 25 after adjustments				
$D(LFDI) = C(1)*(LFDI(-1) + 1.23495448622*LST(-1) - 26.2016838894) +$ $C(2)*(LGDP(-1) + 4.28032393629*LST(-1) - 44.4766101224) + C(3)$ $*D(LFDI(-1)) + C(4)*D(LFDI(-2)) + C(5)*D(LGDP(-1)) + C(6)*D(LGDP(-2))$ $+ C(7)*D(LST(-1)) + C(8)*D(LST(-2)) + C(9)$				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.409240	0.114078	-3.587390	0.0025
C(2)	0.007161	0.055135	0.129880	0.8983
C(3)	-0.008352	0.196424	-0.042522	0.9666
C(4)	0.048690	0.185463	0.262532	0.7963
C(5)	0.789847	1.359557	0.580959	0.5694
C(6)	1.950521	1.497907	1.302164	0.2113
C(7)	0.450174	0.173019	2.601870	0.0193
C(8)	0.213332	0.143511	1.486518	0.1566
C(9)	-0.113688	0.157879	-0.720094	0.4819
R-squared	0.615355	Mean dependent var		0.064002
Adjusted R-squared	0.423033	S.D. dependent var		0.460866
S.E. of regression	0.350066	Akaike info criterion		1.012325
Sum squared resid	1.960743	Schwarz criterion		1.451120
Log likelihood	-3.654058	Hannan-Quinn criter.		1.134028
F-statistic	3.199600	Durbin-Watson stat		2.065208
Prob(F-statistic)	0.022768			

C(1) = Coefficient of integration model or the coefficient of dependent variable or the coefficient of error correction model, also

C(1) = Speed of adjustment towards long run equilibrium.

## INTERPRETATION OF RESULTS

- The coefficient of C(1) must be negative and significant to ensure that there is both long run and short run causality running from GDP and ST to FDI inflows, where
- C(1) = Speed of adjustment towards long-run equilibrium
- C(1) is coefficient of dependent variable.
- In this case, error correction coefficient C(1) is not only negative but also significant.
- The value of R-squared is 0.615355 which is high. Also Prob (F-statistic) is 0.022768 which is 2.28% (less than 5%) which means that all the independent variables jointly can influence the dependent variable. This also shows that the whole model is viable.
- The coefficient of C(1) is -0.409240 which means it is 40.94 percent which shows that it is adjusting towards long-run equilibrium approximately at the rate of 50%.
- Coming to other coefficients i.e. C(2), C(3), C(4), C(5), C(6) C(7), C(8) and C(9) are all short run coefficients not long run.

- C(2) is the coefficient of LGDP(-1)
- C(3) is the coefficient of D(LFDI(-1))
- C(4) is the coefficient of D(LFDI(-2))
- C(5) is the coefficient of D(LGDP(-1))
- C(6) is the coefficient of D(LGDP(-2))
- C(7) is the coefficient of D(LST(-1))
- C(8) is the coefficient of D(LST(-2))
- C(9) is the constant.

To test for exogeneity, Wald test is applied using coefficients of C(1) and C(2)

### WALD TEST FOR WEAK EXOGENEITY

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	7.767861	(2, 16)	0.0044
Chi-square	15.53572	2	0.0004
Null Hypothesis: C(1)=C(2)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		-0.409240	0.114078
C(2)		0.007161	0.055135
Restrictions are linear in coefficients.			

### INTERPRETATION:

The Null Hypothesis states that  $C(1)=C(2)=0$  which means that FDI is weak exogenous. The Chi-square is 15.53572 and the P-value is 0.0004, which is less than 5%, the null hypothesis can be rejected and it can be concluded that FDI is not weakly exogenous.

Empirical results reveal that Johansen Cointegration test shows one cointegrating relationship between LFDI and LGDP which is also true in case of LST (using three variables give 2 cointegrating equations). This leads to application of VECM and to interpret VECM, system equation model is used which confirms that FDI has a significant relationship with GDP and ST. Also the Coefficient of error correction model confirms that

there exists a long run causality running from GDP and sectarian terrorism to FDI in-flows and values converge towards equilibrium. Exogeneity test also conveys that FDI is not weakly exogenous.

## 7. VECM FOR MODEL 2

**TABLE- 8 VECTOR ERROR CORRECTION MODEL (VECM)**

### Test Details

- LGDP is the dependent variable whereas LFDI and LST are independent variables.
- VECM automatically creates first difference of data.
- As Johansen Cointegration test suggested two cointegrating equations, number of cointegration has been manually set at 2.
- The number of coefficients are always equal to P-values but P-values are not shown in VECM
- Var type; Vector Error Correction.
- Lag Interval for Endogenous: 1 2
- Endogenous Variables: LFDI LGDP LST

Vector Error Correction Estimates			
Sample (adjusted): 1992 2016			
Included observations: 25 after adjustments			
Standard errors in ( ) & t-statistics in [ ]			
Cointegrating Eq:	CointEq1	CointEq2	
LGDP(-1)	1.000000	0.000000	
LFDI(-1)	0.000000	1.000000	
LST(-1)	4.280324 (0.94226) [ 4.54262]	1.234954 (0.35920) [ 3.43804]	
C	-44.47661	-26.20168	
Error Correction:	D(LGDP)	D(LFDI)	D(LST)
CointEq1	-0.020542 (0.01010) [-2.03455]	0.007161 (0.05513) [ 0.12988]	-0.158062 (0.10673) [-1.48101]
CointEq2	0.034459 (0.02089) [ 1.64948]	-0.409240 (0.11408) [-3.58739]	-0.098904 (0.22082) [-0.44789]
D(LGDP(-1))	-0.092226 (0.24897) [-0.37042]	0.789847 (1.35956) [ 0.58096]	4.206466 (2.63173) [ 1.59837]
D(LGDP(-2))	-0.602770 (0.27431)	1.950521 (1.49791)	2.885937 (2.89953)

	[-2.19741]	[ 1.30216]	[ 0.99531]
D(LFDI(-1))	0.054365 (0.03597) [ 1.51138]	-0.008352 (0.19642) [-0.04252]	-0.360561 (0.38022) [-0.94829]
D(LFDI(-2))	0.000501 (0.03396) [ 0.01474]	0.048690 (0.18546) [ 0.26253]	-0.187439 (0.35900) [-0.52211]
D(LST(-1))	0.045745 (0.03168) [ 1.44376]	0.450174 (0.17302) [ 2.60187]	0.110609 (0.33492) [ 0.33026]
D(LST(-2))	-0.013392 (0.02628) [-0.50958]	0.213332 (0.14351) [ 1.48652]	0.328920 (0.27780) [ 1.18402]
C	0.125540 (0.02891) [ 4.34213]	-0.113688 (0.15788) [-0.72009]	-0.562657 (0.30561) [-1.84110]
R-squared	0.432972	0.615355	0.553460
Adj. R-squared	0.149459	0.423033	0.330190
Sum sq. Resids	0.065755	1.960743	7.346947
S.E. equation	0.064107	0.350066	0.677631
F-statistic	1.527165	3.199600	2.478884
Log likelihood	38.78515	-3.654058	-20.16608
Akaike AIC	-2.382812	1.012325	2.333286
Schwarz SC	-1.944016	1.451120	2.772081
Mean dependent	0.074945	0.064002	-0.073026
S.D. dependent	0.069512	0.460866	0.827976
Determinant resid covariance (dof adj.)		0.000121	
Determinant resid covariance		3.16E-05	
Log likelihood		23.09260	
Akaike information criterion		0.792592	
Schwarz criterion		2.401508	

*D (difference) represents short run relationship*

As mentioned earlier in VECM for first model, there are three models; D (LFDI), D(LGDP) and D(LST) but D(LGDP) is the main target model in this case as it is the dependent variable whereas D(LFDI) and D(LST) are independent variables. Since this model does not show P-value (Probability values) for each variable, system equation model is estimated to find P-values.

Again VECM has been applied using two lags. Here D(LGDP) is the dependent variable. It is also the coefficient of CointEq1. There are three models but D(LGDP) is the target model. It is also known as “error correction model”. Mentioning again, coefficient divided by standard error gives t-value but probability values are required to conclude whether the coefficients are significant or not.

**TABLE-9 SYSTEM EQUATION MODEL**



Dependent Variable: D(LGDP)				
Method: Least Squares				
Sample (adjusted): 1992 2016				
Included observations: 25 after adjustments				
$D(LGDP) = C(1)*(LGDP(-1) + 4.28032393629*LST(-1) - 44.4766101224) + C(2)*(LFDI(-1) + 1.23495448622*LST(-1) - 26.2016838894) + C(3)*D(LGDP(-1)) + C(4)*D(LGDP(-2)) + C(5)*D(LFDI(-1)) + C(6)*D(LFDI(-2)) + C(7)*D(LST(-1)) + C(8)*D(LST(-2)) + C(9)$				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.020542	0.010097	-2.034547	0.0588
C(2)	0.034459	0.020891	1.649475	0.1185
C(3)	-0.092226	0.248973	-0.370424	0.7159
C(4)	-0.602770	0.274309	-2.197409	0.0431
C(5)	0.054365	0.035971	1.511378	0.1502
C(6)	0.000501	0.033963	0.014743	0.9884
C(7)	0.045745	0.031685	1.443763	0.1681
C(8)	-0.013392	0.026281	-0.509578	0.6173
C(9)	0.125540	0.028912	4.342129	0.0005
R-squared	0.432972	Mean dependent var		0.074945
Adjusted R-squared	0.149459	S.D. dependent var		0.069512
S.E. of regression	0.064107	Akaike info criterion		-2.382812
Sum squared resid	0.065755	Schwarz criterion		-1.944016
Log likelihood	38.78515	Hannan-Quinn criter.		-2.261109
F-statistic	1.527165	Durbin-Watson stat		2.160919
Prob(F-statistic)	0.223909			

C(1) = Coefficient of integration model or the coefficient of dependent variable or the coefficient of error correction model, also

C(1) = Speed of adjustment towards long run equilibrium.

## INTERPRETATION OF RESULTS

(Similar to previous model in some specifications but results are different)

- The coefficient of C(1) must be negative and significant to ensure that there is both long run and short run causality running from GDP and ST to FDI inflows, where
- C(1) = Speed of adjustment towards long-run equilibrium
- C(1) is coefficient of dependent variable.
- In this case, error correction coefficient C(1) is not only negative but also significant but not at 5% as it is equal to 0.0588 (5.88%) .
- The value of R-squared is 0.432972 which is high. Also Prob (F-statistic) is 0.223909 which is 22.39 % (greater than 5%). This shows that all independent variables cannot affect the dependent variable taken jointly but they might have individual influence.
- The coefficient of C(1) is -0.020542 (in percent it is equal to 2.05 which shows that speed of adjustment towards equilibrium is very slow but as the coefficient

of adjustment is significant, this shows equilibrium is reached but at a very slow pace. Coming to other coefficients i.e.  $C(2)$ ,  $C(3)$ ,  $C(4)$ ,  $C(5)$ ,  $C(6)$ ,  $C(7)$ ,  $C(8)$  and  $C(9)$  are all short run coefficients not long run.

- $C(2)$  is the coefficient of  $(LFDI(-1))$
- $C(3)$  is the coefficient of  $D(LGDP(-1))$
- $C(4)$  is the coefficient of  $D(LGDP(-2))$
- $C(5)$  is the coefficient of  $D(LFDI(-1))$
- $C(6)$  is the coefficient of  $D(LFDI(-2))$
- $C(7)$  is the coefficient of  $D(LST(-1))$
- $C(8)$  is the coefficient of  $D(LST(-2))$
- $C(9)$  is the constant.

Again to check that whether short run variables affect dependent variable jointly, Wald test is used.

#### WALD TEST FOR WEAK EXOGENEITY

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	2.416330	(2, 16)	0.1211
Chi-square	4.832660	2	0.0892
Null Hypothesis: C(1)=C(2)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		-0.020542	0.010097
C(2)		0.034459	0.020891
Restrictions are linear in coefficients.			

#### INTERPRETATION:

- The Null Hypothesis states that  $C(1)=C(2)=0$  which means that GDP is weak exogenous. The Chi-square is 4.83 and the P-value of 0.0892 is higher than 5%, the null hypothesis cannot be rejected and it can be concluded that GDP is weakly exogenous. (at 10% it can be concluded that it is not weakly exogenous).

#### 8- VEC GRANGER CAUSALITY/BLOCK EXOGENEITY WALD TEST

##### Test Details

- Null hypothesis ( $H_0$ ) states that there is no granger causality.

- If Chi-sq is greater than critical value (P-value is smaller than significance level) then null hypothesis is rejected meaning that taken all lags together, independent variable granger cause dependent variable/ can affect dependent variable in future/ can predict future values.

VEC Granger Causality/Block Exogeneity Wald Tests			
Sample: 1989 2016			
Included observations: 25			
Dependent variable: D(LFDI)			
Excluded	Chi-sq	df	Prob.
D(LGDP)	2.295301	2	0.3174
D(LST)	6.776192	2	0.0338
All	17.78289	4	0.0014
Dependent variable: D(LGDP)			
Excluded	Chi-sq	df	Prob.
D(LFDI)	2.355747	2	0.3079
D(LST)	4.997206	2	0.0822
All	6.951486	4	0.1385
Dependent variable: D(LST)			
Excluded	Chi-sq	df	Prob.
D(LFDI)	1.372210	2	0.5035
D(LGDP)	4.081594	2	0.1299
All	5.286726	4	0.2591

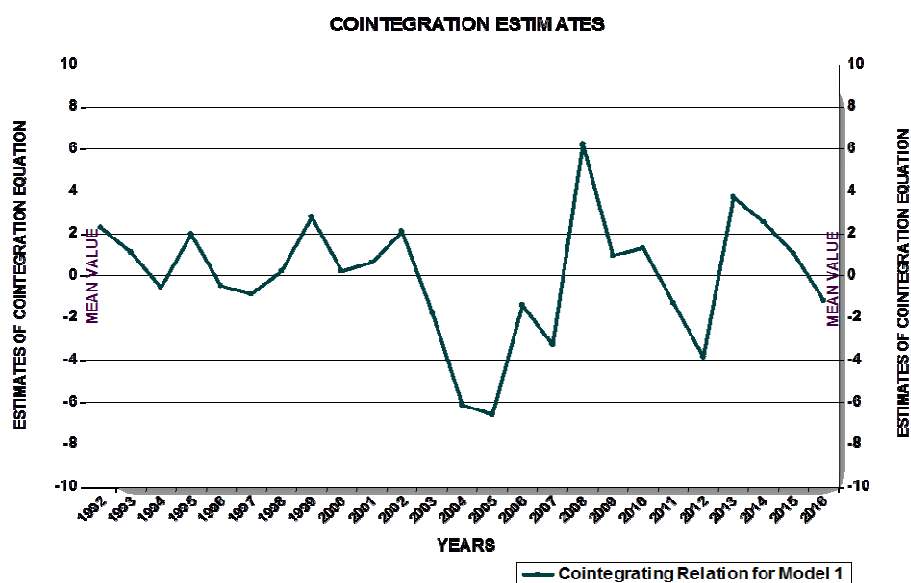
#### INTERPRETATION:

- MODEL 1: Strong evidence of granger causality exists.
- MODEL 2: No evidence of granger causality.
- MODEL 3: No evidence of granger causality.

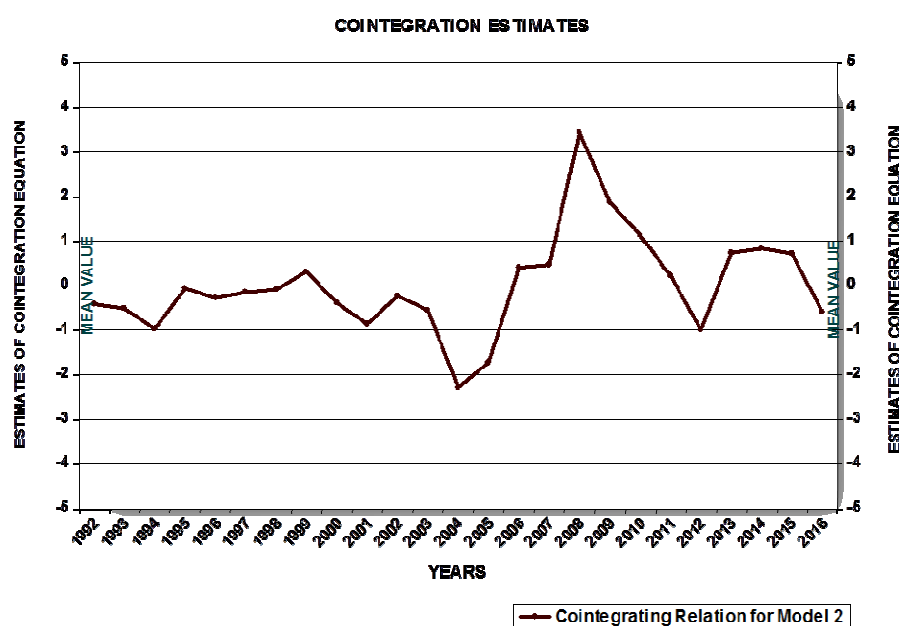
## 9- COINTEGRATING RELATIONS

In the end, estimations of cointegration equations for both models will be analyzed with the help of graphical technique. All estimates must be having a normal distribution having zero mean and all values must fluctuate around the mean value i.e. the estimates are stationary.

**GRAPH- 10** ESTIMATES OF COINTEGRATING EQUATION FOR MODEL-1



**GRAPH- 11** ESTIMATES OF COINTEGRATING EQUATION FOR MODEL-2



Graphical representation shows that both models are stable and they converge towards equilibrium in the long run.

## 10- EMPIRICAL FINDINGS OF BOTH MODELS, CONCLUSION, DISCUSSION AND RECOMMENDATIONS

In this study time series data of Pakistan covering a period of 1989 – 2016 has been used for conducting an empirical analysis to determine the relationship between FDI inflows and economic growth of Pakistan in light of sectarian terrorism. This study is unique in the sense that it uses most updated data of Pakistan and tests two way causali-

ty to confirm the relationship between FDI inflows and economic growth of Pakistan. In the first model, the variable of FDI inflows has been taken as dependent variable along-with economic growth and terrorism as independent variables. In the second model, economic growth has been taken as a dependent variable whereas FDI inflows and terrorism act as independent variables. As every time series requires a unit root test for checking stationarity status of variables, ADF and KPSS tests have been applied to check the stationarity status of variables included in dataset. Both tests show that all series are stationary at 10% level of significance. Later Johansen Cointegration test has been applied twice. In first test LFDI and LGDP are used to find Cointegration and second time all three series (LFDI, LGDP and LST) have been used. After establishing a strong Cointegration which is evident from the results of Johansen Cointegration test, VECM is used for further investigation. As in first model LFDI is taken as a dependent variable, VECM is applied by taking LGDP and LST as independent variables. To find probability values, system equation model is conducted. In first model, the coefficient of dependent variable is found to be significant showing that LGDP and LST affect FDI inflows both in short and long run. Moreover, the whole model shows that all independent variables can jointly affect the dependent variable.

On the other hand, in second model where LGDP serves as the dependent variable, same results have been found; the coefficient of dependent variable is significant meaning that LGDP is affected by both LFDI and LST but probability of F-statistic shows that all independent variables taken together or jointly, cannot influence independent variable but they may have an individual impact. In this context, model 1 is more practical as compared to model 2 but the purpose is achieved and a two-way causality has been confirmed by empirical analysis. The Cointegrating equations also show stationarity leading to the conclusion that both models tend to converge towards equilibrium over long run time period. Impulse responses and variance decomposition tests show the effect of shocks or fluctuations in endogenous variables on other variables, the detailed empirical analysis explains the behavior of shocks and fluctuations in all variables caused by each other. Wald test and Granger Causality tests have been applied to check the exogeneity and causality respectively. The results show that FDI is not weakly exogenous whereas the second model concludes that GDP is weakly exogenous. The same results are confirmed by Granger Causality test.

Another important point has been revealed by normalized Cointegration equations which show that all series move in same direction (LFDI, LGDP and LST have same signs). A positive relationship between FDI inflows and GDP is expected and leads to desirable results but positive sign with ST shows that LDFI, LGDP and LST, all move in same direction. An important factor brought forward by the data is that despite increase in terrorism in the form of sectarianism in Pakistan, FDI inflows have also increased in recent years at a very fast rate. A detailed analysis reveals that major portion of FDI inflows in Pakistan are from China in the form of CPEC (for details refer to table-1 in literature review). The growth in FDI inflows despite increased number of sectarian based terrorist incidents in Pakistan is due to the net effect of these two opposing forces where FDI inflows outweigh terrorist incidents. Therefore it can be concluded that whether the causation runs from FDI to growth or from growth rate to FDI in presence of sectarian terrorism, there exists two way causality, for first case it is for both in

short run and long run and for second case, it is only in short run. FDI inflows lead to an increase in economic growth but this relationship is affected by sectarian terrorism in Pakistan.

After discussing and concluding empirical findings, theoretical discussion also leads to same conclusion. In other words, growth rate increases as a result of increase in FDI inflows but sectarian terrorism acts as an obstacle. Nonetheless presently terrorist activities have been controlled in Pakistan after the Military Operation of Zarb-e-Azab. This is evident from CPEC which is one of the biggest investment in Pakistan carried out by China. Impact of Zarb-e-Azab on terrorism in Pakistan and the effects of CPEC cannot be tested empirically as both these plans are ongoing and started recently. Also there is no long run or enough data which could be used for carrying out empirical analysis. Although there are many theoretical studies on both topics but long run empirical study can be conducted only after some years when the effects are clearer and ample data is available for empirical analysis.

As indicated in literature review also, the incident of 9/11 resulted in reshaping the global scenario and the differences between North and South increased. The most disastrous consequences were faced by developing countries and this trend is still going on. Out of developing countries, Muslim countries faced the worst consequences since the incident of 9/11 was attributed to Muslims and a wave of prejudice and hatred got spread against them, particularly in the West. Afghanistan got devastated with more than one million people dead. The Middle Eastern countries like Iraq, Libya, Syria, and Yemen etc. got worst hit and the spillover effects are still continuing in the form of destroyed economies, death of millions while millions got displaced. Although sectarian violence was already a part of Pakistan's socio-politico-economic system but religious differences increased manifold after 9/11 incident. US started a war on terror against Muslim countries and Asia got hit in an unexpected worst way. This resulted in a reaction and many groups in Muslim countries turned to militancy and they fought back. Different groups came on surface based on ideologies; some had extreme reaction which lead to suicide bombing with the concept that such an act is confirmed for landing in heaven. Groups with opposing ideologies emerged who did not believe in killing and terror which lead to armed conflicts among Muslim sects. So far the results are consistent with other studies that terrorist incidents increased after 9/11 attacks but the argument made in this study that all this was based on conflicting religious views is found to be correct. This study has viewed all these factors with a different angle and results have also been proved that presently, sectarian terrorism is the result of conflicting religious ideologies. Islam is a religion of peace, tolerance and enjoins its believers to respect life, honor and property of everyone irrespective of religious beliefs. Sadly, majority amongst the non-Muslims has dubbed Islam for preaching terrorism against non-Muslims while the disgruntled elements amongst the Muslim sects have declared violence, including killing of non-Muslims as well as the believers belonging to opposite sects as virtuous deeds leading to heaven. Both are patently wrong. Therefore, I would recommend that Muslims and non-Muslims must have an interfaith dialogue at global level to develop mutual understanding and tolerance for each other. Not only this, the Muslim countries have to make concerted efforts to develop a consensus code of conduct in the light of fundamental teachings of Islam so that different sects amongst Mus-

lims develop not only tolerance but brotherly feelings for each other. This multiple dialogue with complete sincerity and honesty is the only way out to develop tolerance and mutual respect not only amongst Muslims and non-Muslims but also amongst believers of different sects of Muslims which would definitely make this world a peaceful abode for all the human beings.

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